Volume 091
Article 03

IDAHO
DEPARTMENT OF FISH AND GAME

Jerry M. Conley, Director

FEDERAL AID IN FISH RESTORATION
Job Performance Report
Project F-71-R-15

REGIONAL FISHERIES MANAGEMENT INVESTIGATIONS

Job No. 5-b.	**Region 5 Lowland Lakes and Reservoirs Investigations**
Job No. 5-c.	**Region 5 Rivers and Streams Investigations**
Job No. 5-d.	**Region 5 Technical Guidance**

By

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September 1993

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Job No. 5-d. Region 5 Technical Guidance

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JOB PERFORMANCE REPORT

Name: **Regional Fisheries Management Investigations**

State of: **Idaho**

Title: **Region 5 Lowland Lakes and Reservoirs Investigations**

Project No: **F-71-R-15**

Job No.: **5-b**

Period Covered: **July 1, 1990 to June 30, 1991**

ABSTRACT

Fingerling rainbow trout planted in Chesterfield and Montpelier reservoirs attained catchable size within a 22-month period. We believe yellow perch are negatively impacting Montpelier Reservoir's trout population.

Selected physical and chemical characteristics of 25 Region 5 reservoirs were surveyed in June and August of 1990. A morphoedaphic index (MEI) was calculated for each water. Return-to-the-creel counts of rainbow trout planted at 8- to 10-inches (203-254 mm) in reservoirs were less than the minimum 40% return rate objective for put-and-take fisheries in the 1991-1995 State Fishery Management Plan (1990). These reservoir fisheries function more as put-grow-and-take fisheries, however, where the goal is 100% return by weight. Many of these waters are popular fisheries, and without additional data, discontinuing these plants is not recommended.

We evaluated largemouth bass (LMB) populations in St. John's, Weston, and Pleasantview reservoirs. St. John's Reservoir LMB populations had good growth, condition, and size structure, similar to that observed by Schill (1990) for Weston Reservoir. The Proportional Stock Density (PSD) for LMB at St. John's Reservoir was 46%. PSD's of 40% to 60% for LMB are indicative of a desirable sport fishing size structure. We collected insufficient numbers of LMB from Weston and Pleasantview reservoirs to describe their populations.

We conducted a creel survey on 17.8-hectare Twenty-four Mile Reservoir from May 27 to August 8, 1989. Anglers fished 13,725 hours (771 h/hectare) and harvested 4,327 trout, of which 3,593 (83%) had been stocked as hatchery catchables. The catch rate was 0.31 fish/h. Average length of harvested fish was 302 mm (11.9 in). These data form the basis for evaluating trophy trout regulations implemented on Twenty-four Mile Reservoir in 1990.

TEXT

We conducted a creel survey on 7,285-hectare Blackfoot Reservoir from May 26 to October 9, 1990. Anglers fished 56,944 hours (7.8 h/hectare) and harvested 10,388 trout, of which 2,295 (94%) were hatchery rainbow trout. The catch rate was 0.18 fish/h.

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TEXT

OBJECTIVES

1. To monitor sport fisheries at several popular fishing reservoirs in Region 5.

2. To describe physical and chemical conditions on selected Region 5 reservoirs.

3. To evaluate performance of both fingerling and harvestable-sized trout stocked in Region 5 waters.

4. To assess age and growth rates of largemouth bass from Pleasantview, St. John's, and Weston reservoirs.

5. To evaluate angler use and harvest on Twenty-four Mile Reservoir.

6. To monitor the Blackfoot Reservoir sport fishery and continue evaluation of Bear Lake cutthroat and hatchery rainbow trout fingerling programs.

METHODS

Evaluations

Gill Net Surveys

We used experimental gill nets to assess fisheries status and performance of fall-planted fingerling rainbow and rainbow/cutthroat hybrid trout in Chesterfield, Twenty-four Mile, Montpelier, Pleasantview, Devils Creek, Daniels, and Treasureton reservoirs in 1990. We also evaluated effects of competition with yellow perch on cutthroat trout in Montpelier Reservoir.

We identified, weighed, and measured net-caught fish and collected scale samples. All fish measurements in this report are total lengths. Two experimental sinking gill nets were used in all waters. The nets were 125 feet long and composed of 5 individual panels, each being 6 feet deep x 25 feet long, with square-mesh size of 3/4 in and 1 in of #3 twine, 1 1/2 in and 2 in of #4 twine, and 3 in of #6 of twine, and the leadline was 30 lb of leadcore. We set nets at dusk perpendicular to the shoreline with the smallest mesh toward shore. The five mesh sizes progressively increased in size from one end of the net to the other. Nets were keyed to shoreline structures, such as channel edges and shoals. Nets were checked periodically and fished until 25 fish were captured or four hours had elapsed.

In an attempt to assess the contribution of stocked fingerlings to respective reservoir fisheries, gill net-sampled hatchery rainbow trout were aged using magnified scale impressions.

TEXT

Physical and Chemical Surveys

We surveyed physical-chemical characteristics of 15 Region 5 reservoirs in 1989 and 1990 to evaluate fish habitat suitability. Information collected included maximum depth (m), total dissolved solids (TDS) in ppm, average depth of Sechhi disc visibility (m), dissolved oxygen (mg/1), and water temperature (°C). TDS was measured indirectly using a Fisher digital conductivity meter. Dissolved oxygen concentrations and water temperatures were measured using a YSI model 54ABP Dissolved Oxygen Meter with a model 5439 probe. We calculated a morphoedaphic (MEI) index for each water. We measured TDS, dissolved oxygen, and water temperature at 1-m depth intervals from surface to bottom during July and August.

Catch Rates from Region 5 Fisheries (Spot Creel Checks)

Conservation officers and fishery personnel collected catch rate and catch composition information at several Region 5 reservoirs in 1990. These data were collected during routine officer patrols or while conducting various fishing surveys. Anglers were typically checked before they had completed angling.

Creel data from the conservation officer patrols are collected as part of their annual work program. Most fisheries data come during the months of January through September. On average, within a given body of water, officers collected fisheries data during two to three months in 1990. On four reservoirs; Condie, Hawkins, Twenty-four Mile and Winder; data were collected during five or more months.

Catchable Trout Evaluations

The number of tagged catchable-sized rainbow trout released, and the number of tags subsequently returned, were tabulated. See Schill (1990) for methods. We assumed the vast majority of tags would be recovered within the first angling season and that nearly 100% of recovered tags (reward offered) were returned.

Largemouth Bass

Largemouth bass (LMB) populations in St. Johns, Weston, and Pleasantview reservoirs were sampled by electrofishing, one night each, in mid-May 1990. See Schill (1990) for methods.

TEXT

Twenty-four Mile Reservoir, 1989

A creel survey was conducted on Twenty-four Mile Reservoir beginning the opening day of fishing season, May 25, 1989, and continuing through August 12, 1989. The survey was conducted to assess angler use, harvest, and contribution of fall-stocked fingerling rainbow trout to the fishery. We counted bank and boat anglers during three 4-hour periods during daylight. We interviewed anglers at a check station operated from dawn through dusk on the only access road to the reservoir. We used a pneumatic automated car counter to establish a linear relationship between vehicle counts and known angler effort on days when creel surveys were conducted.

Two weekdays and two weekend days were randomly selected within two-week time intervals for sampling. The beginning count was taken as near to 8 AM as possible, with subsequent counts spaced evenly apart based on mean daylight hours for each interval. Mean number of bank and boat anglers within each day type (weekday, weekend, and holiday) were multiplied by mean daylight length and by number of days of that type per interval to provide a total estimated number of bank and boat angler hours for each 14-day interval.

Blackfoot Reservoir

A creel survey was conducted on Blackfoot Reservoir beginning the opening of the fishing season, May 26, 1990, and continuing through October 9, 1990. The survey assessed angler effort, catch, harvest, and catch rate particularly on wild cutthroat trout. We used similar methods to those described (above) for Twenty-four Mile Reservoir, including bank and boat counts, and pneumatic automated car counters placed at access roads (Figure 1).

RESULTS

Evaluations

Gill Net Surveys

Hatchery rainbow trout comprised the majority of fish captured in Twenty-four Mile (100%), Chesterfield (75%), Daniels (73%), Pleasantview (63%), and the minority of the catch in Montpelier (23%) and Devil's Creek (22%) reservoirs (Table 1). Cutthroat trout were captured in Montpelier (16%), Devils Creek (11%), Daniels (8%), and Chesterfield (3%) reservoirs. Kokanee were captured in Devil's Creek (67%), Chesterfield (13%), and Pleasantview (12%) reservoirs. Largemouth bass (19%) and crappie (2%) were captured in Pleasantview Reservoir.

TEXT

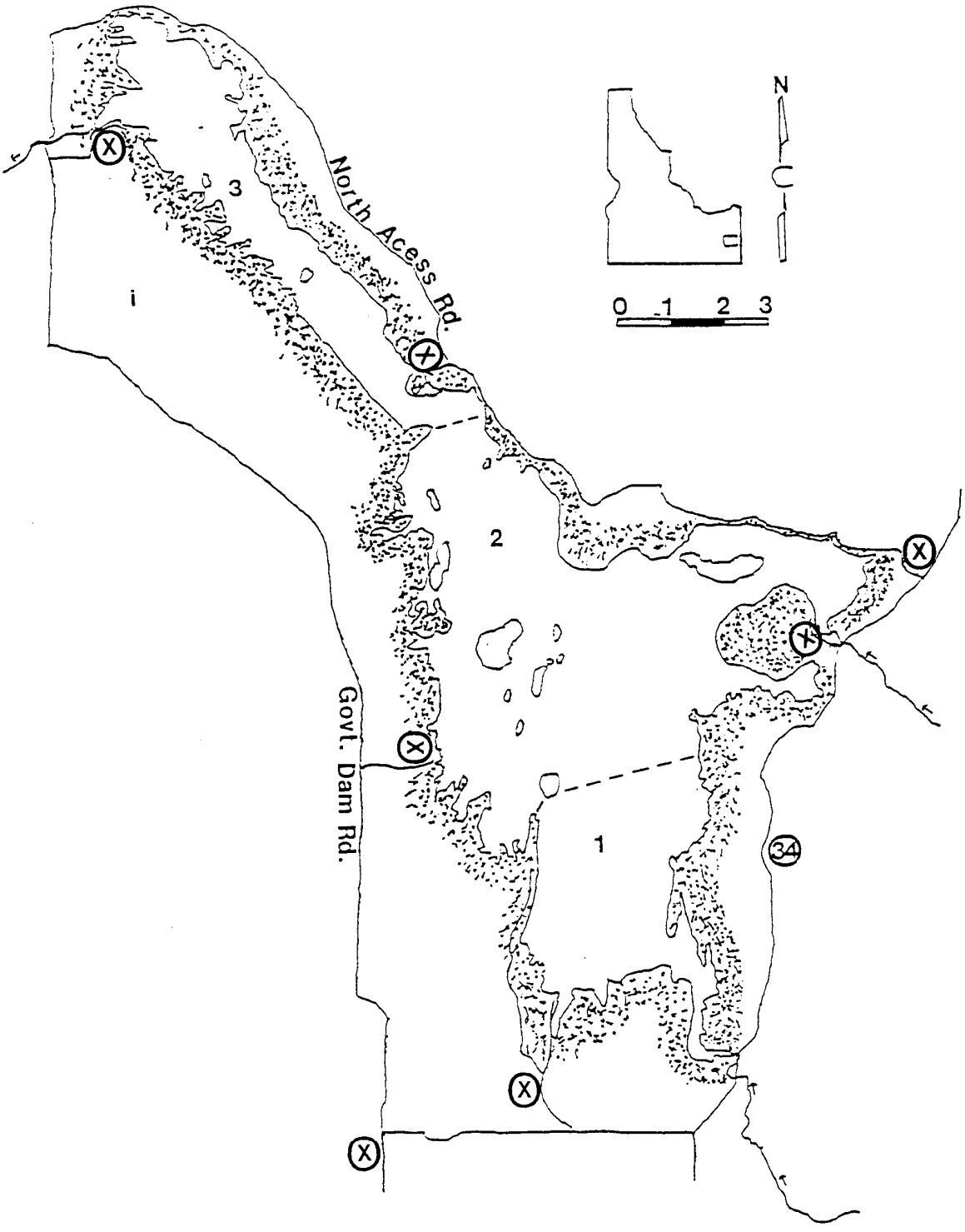

Figure 1. Map of Blackfoot Reservoir showing location of automated car counters (x) and reservoir subsections used in 1990 creel survel.

Table 1. Relative species composition and sample size from experimental gill net catches at six Region 5 reservoirs, 1990.

Date	Water	Relative species composition (percent) HRBT(%)	HRBT/CUT($)	CUT(%)	KOK(%)	LMB(%)	PERCH(%)	n
July 23-4	Chesterfield	75	--	3	13	--	--	29
	24 Mile	100	--	--	--	--	--	47
July 26-7	Pleasantview	63	--	--	12	19	--	91
July 27	Montpelier	23	--	16	--	--	61	44
Oct. 2	Devils Cr.	22	--	11	67	--	--	54
Oct. 7-8	Daniels	73	21	8	--	--	--	102

SECBTBLH

The majority (60%) of fish caught in Montpelier Reservoir was yellow perch. Graphic representations of respective population structures are presented in Appendices A-E.

Chesterfield Reservoir was stocked with 51,350 (79.2/hectares; 32.1/acres) 80 mm (3.3 in) fingerling rainbow trout in October of 1988 after a rotenone treatment earlier that year. Scales taken from 22 of these fish in September 1990 were examined to determine age and annual growth. Back-calculated lengths at ages 1 and 2 were 133 mm and 207 mm, respectively, indicating that growth in their first full year in Chesterfield Reservoir was 74 mm (2.9 in) (Table 2). Circuli patterns on scales of fish sampled in 1990 indicated that some of the trout were 3 and 4 years old; i.e., these fish would have had to survive the 1988 rotenone treatment.

This growth appears slow for trout in the highly productive Region 5 waters. Two factors may partially explain this observation. Annual precipitation in Southeast Idaho has been below normal from the time the fingerlings were stocked through the time scale samples were taken. The drought condition has resulted in low reservoir water levels each year by mid-summer. High water temperatures (>21°C) have been associated with shallow reservoir depths from mid-July through early September.

At such high water temperatures, salmonids routinely cease feeding and become relatively dormant (Everhart et al. 1975). This condition could result in narrowing of circuli spacing on the scales that would appear similar to annuli caused by slow growth in winter. Scale evaluations would record both the true and false annuli, thus increasing the estimated age. Secondly, it was difficult to visually distinguish hatchery catchables from fingerling trout after having spent several months or years in a reservoir. Catchable size trout generally have deformed dorsal fins and most fingerlings stocked do not. However, fin conditions of individual fish differ greatly. Thus, dorsal fin appearance is not a reliable method to distinguish between trout stocked at catchable size or fingerling size after passing several months in a reservoir. Therefore, the size at which a fish was stocked and its estimated growth could be in error. Performance evaluations of trout stocked at catchable and fingerling size should be based on known age fish using fin clips.

Evaluations of fingerling trout growth rates should be continued in Region 5 waters for a series of years within a wide range of annual precipitation. Use of hatchery fingerling plants should not be discontinued, particularly in popular angling waters, based on a single stocking's poor performance.

Anglers expressed concern about low catch rates and small trout sizes in Montpelier Reservoir. One possible cause for these problems is adverse comp_tition from illegally introduced yellow perch. Mean length of cutthroat trout in the catch was 241 mm (9.5 in), while that of yellow perch was 151 mm (5.9 in). Additionally, cutthroat were in poor condition with little or no visceral fat. The abundant small perch appear to have a negative effect on trout growth and condition.

TEXT

Table 2. Average back-calculated lengths (mm) at the time of annuli formation for each age class of hatchery rainbow trout, Chesterfield Reservior,1990.

Year class	Age	N	Back-calulation Age 1	2	3	4
1989	1	3	170			
1988	2	14	133	207		
1987	3	2	161	251	338	
1986	4	1	117	157	192	273
All Classes		20	140	209	290	273
N		20	20	17	3	1

SECBTBLV

Physical and Chemical Surveys

We present physical-chemical data from mid to late summer in 1990 for 15 Region 5 reservoirs (Table 3). Most were sampled in July; some were sampled in August, September or October. These dates represent drawdown minimum pool conditions typical for Region 5 irrigation reservoirs.

Morphoedaphic indices ranged from 2.0 at Lamont Reservoir to 39.4 at Hawkins Reservoir (Table 4). Expected annual catches, based on Ryder's (1965) relationship between MEI and annual catch, would range from 1.4 to 5.6 kg/hectares, respectively. Ryder's data set may have come from a cooler climate than that of Southeast Idaho, thus the expected catches may be too low. The relationship between MEI and expected catch increases in warmer climates, with about a 10-fold increase in harvest in tropical areas as compared to Ryder's north temperate relationship (Figure 2).

Based on a relatively high MEI (3.4) and a large surface area (408 hectares), Alexander Reservoir should produce the largest catch, nearly a magnitude larger, than any of the other 14 reservoirs surveyed. However, do mainly to soil turbidity (Secchi disc visibility of 1.2 m near the dam) and sedimentation, Alexander Reservoir is considered one of the poorest fisheries in Region 5.

Average depth values in Table 3 may be too high, based on insufficient measurement in shallow parts of the reservoirs. This would cause the MEI and expected catch values reported here to be low. Additional depth information will be collected and reported in future Region 5 reports.

Additionally, most (all but Alexander) of the reservoirs in Table 3 are managed for irrigation. Volumes, areas, and depths in mid to late summer can be very small compared to conditions when the reservoirs are full. It would seem that the MEI or other indices of productivity for these "drawdown" reservoirs would not be directly applicable. An index of productivity, which is based on the annual cycle of drawdown reservoirs, is needed to better predict their productive potential. Such an index may need to incorporate the effects of rapid drawdown in early summer on spawning success of warmwater fish, the effect of restricted volume, isolated from riparian cover relative to predation on limited recruitment of warmwater fish, and the effect of high water temperature on cold water fish species, during mid-summer when reservoirs become very shallow as a result of severe drawndown conditions.

Catch Rates from Region 5 Fisheries (Spot Creel Checks)

Region 5 conservation officers obtained catch rates and species composition data from 965 anglers on 18 fisheries in 1990 (Table 4). Data from ice fisheries on Condie, Deep Creek, Foster, Johnson, Lamont, Twin Lakes, and Weston reservoirs indicate that winter and summer catch rates for trout and perch are

Table 3. Physical and chemical characteristics of selected Region 5 reservoirs sampled in July and August, 1990.

Water	Depth (m) Max	Depth (m) Mean	TDS in PPM	MEI[a]	Depth of Visibility	Temp © Average	Dissolved Oxygen (mg/l)
Alexander	-	6.7	154.6	7.0	1.2	20.0	5.9
Condie	-	6.7	462.0	21.0	0.9	14.9	7.8
	"						
Crowthers	29.1	18.3	343.3	5.7	1.6	12.8	4.4
Devil's Creek	31.3	15.3	240.6	4.8	1.35	13.7	6.3
	"	7.5	250.3	10.2	1.0	15.0	7.4
Foster	23.1	18.3	158.1	2.6	1.2	13.8	9.3
	"	8.5	-	-	0.9	17.5	7.2
Glendale	26.1	20.1	149.0	2.3	3.8	14.3	8.9
	"	7.2	-	-	0.8	17.4	9.6
Hawkins	16.3	6.1	414.0	20.7	1.15	14.6	7.3
	"	2.4	458.5	58.0	1.3	15.9	11.2
Johnson	17.5	8.5	153.0	5.5	3.3	13.6	7.6
	"	5.2	39.8	2.3	-	20.1	8.1
Lamont	26.2	17.1	150.0	2.7	3.6	14.0	8.8
	"	12.2[b]	50.4	1.3	-	18.6	6.9
Montpelier	32.0	10.4	231.6	6.8	8.1	13.6	10.7
	-	4.9[b]	84.0	5.2	-	16.0	9.3
Springfield	-	3.7	287.0	23.7	3.7	15.2	11.8
	-	3.7[c]	291.3	24.1	3.7	11.4	11.4
Twenty-four Mile	-	10.0	314.0	9.6	5.6	13.9	9.2
	-	4.0°	376.0	28.7	3.3	16.8	6.4
Treasureton	-	6.1	345.7	17.3	3.3	16.8	6.4
	-	2.6	-		1.35	15.4	8.7
Winder	17.7	12.2	158.3	4.0	6.8	16.0	9.6
	"	7.3		-	2.55	18.5	10.3
Wiregrass	11.8	3.2	416.7	39.7	3.2	16.5	9.9
	"	2.7	149.0	16.7	2.3	22.2	5.0

[a] I = TDS mean depth in feet (Ryder 1965)
[b]-Sampled in September, 1990.
[c]-Sampled in October, 1990

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Table 4. Morphoedaphic index (MEI), expected catch rate (kg/hectare) and expected catch (kg) from 15 Region 5 reservoirs.

Reservoir	MEI	Hectares	Expected kg/ha	Expected kg/Reservoir
Lamont	2.0	37	1.4	51.8
Glendale	2.3	93	1.5	139.5
Foster	2.6	59	1.6	94.4
Johnson	3.9	20	1.8	36.0
Winder	4.0	38	1.9	72.2
Condie	5.4	47	2.1	98.7
Montpelier	6.0	53	2.2	116.6
Devil's Creek	7.5	58	2.5	145.0
Crowthers	10.9	11	2.9	31.9
Alexander	14.0	408	3.4	1387.2
Treasureton	17.3	58	3.6	208.8
24-Mile	19.1	18	4.0	72.0
Springfield	23.9	27	4.3	116.1
Wiregrass	28.1	3	4.8	14.4
Hawkins	39.4	16	5.6	89.6

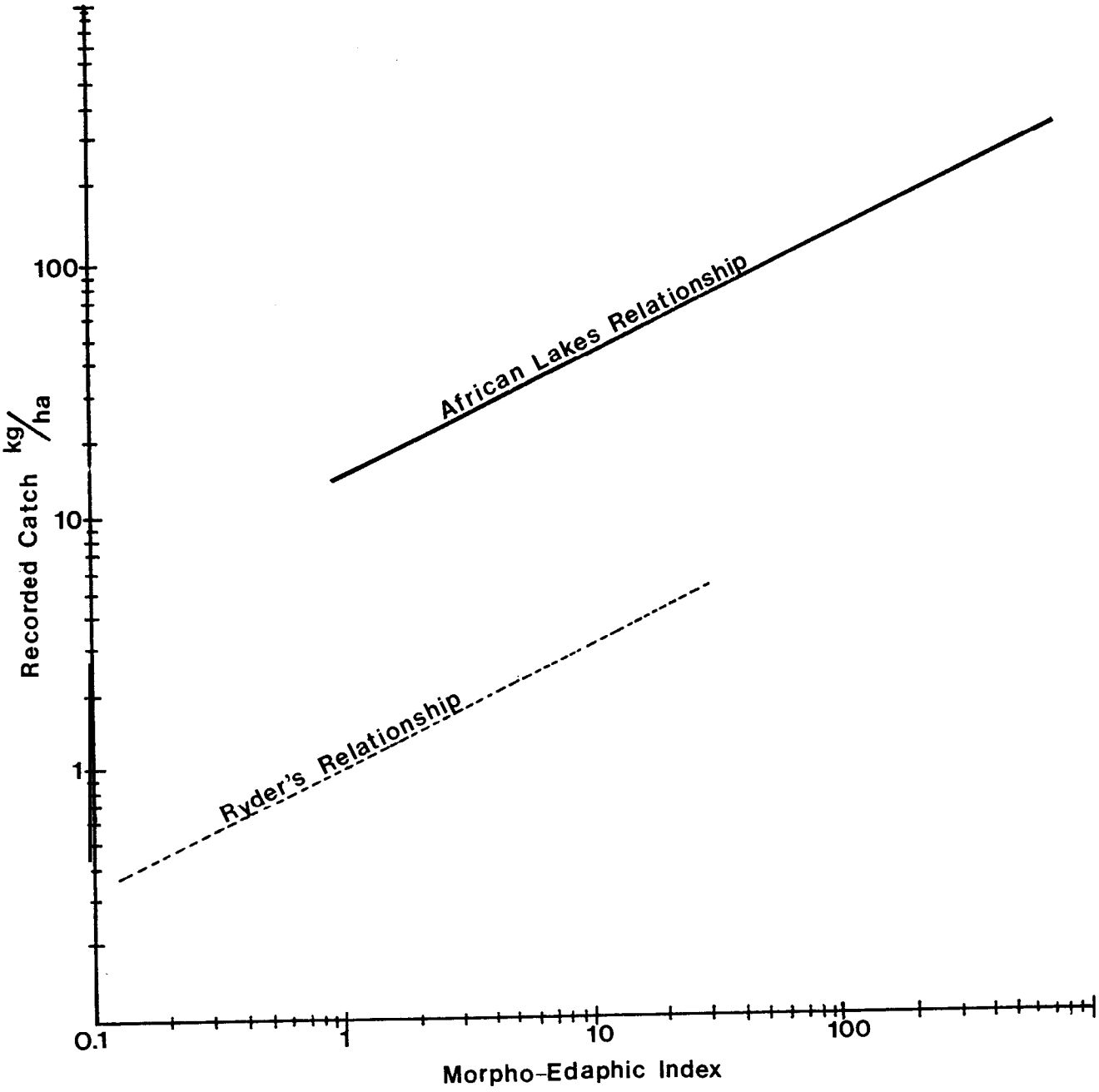

Figure 2. The relationship of morphoedaphic indices and recorded annual catch as estimated by Ryder (1965) for north temperate lakes and by Henderson and Welcomme (1974) for African lakes.

similar. When all species of fish are considered on a year-round basis, including trouts, bass, perch, and bluegill, Oneida and Johnson reservoirs had the highest catch rates; i.e., 8.2 and 5.2 fish/h (Figure 3). Condie and Weston reservoirs had the next highest rates at 1.9 and 1.7 fish/h, respectively. Except for Condie Reservoir, most of the fish caught at these reservoirs were perch. Most of the catch at Condie Reservoir were bluegill. No walleye, which have been introduced into Oneida Reservoir, nor smallmouth bass, which have been introduced into Bear River below Alexander Reservoir, were seen in the surveys.

Catch rates for trout were highest at Twenty-four Mile, Weston, Wiregrass, and Deep Creek reservoirs (Figure 4).

Twenty-four Mile Reservoir, which is managed for quality trout, had the highest catch rate for trout (1.2/h). Two other Region 5 reservoirs managed for quality trout, Condie and Daniels reservoirs, had much lower trout catch rates (0.2 and 0.4 trout/h, respectively).

The majority of anglers in Region 5 are Idaho residents. The more northerly reservoirs, such as Hawkins and Twenty-four Mile are fished almost exclusively by residents. Reservoirs closer to Utah have 20% to 50% non-residents and Devil's Creek Reservoir had 65% non-residents.

Small samples on some waters and/or restricted season of sampling may bias the overall catch rates and species compositions. Nevertheless, these data do provide an overview of fisheries quality throughout the region and indicate which fisheries perform well and which do not.

Catchable Trout Evaluations

Several of the evaluated reservoirs fell far short of the 40% (by number) return-to-the-creel target for put-and-take fisheries referenced in the 5-Year Fisheries Management Plan (1990) (Table 5). These fisheries persist for some time, and where fish are harvested at a considerably larger size than when they are stocked, function more as put-grow-and-take fisheries. The return rate goal for put-grow-and-take fisheries is 100% by weight. We did not evaluate return by weight. Schill (1990) noted that these waters were popular fisheries. Further evaluations of return by number and weight for both catchable and fingerling size trout stockings, will occur in 1992. We will continue to seek management techniques which will improve these fisheries.

Unfortunately, Region 5 reservoirs have experienced severe drought conditions for the past several years. High water temperatures and low dissolved oxygen may have resulted in significant first year mortality and, thus, a reduction in carry-over fish. Rapid reservoir drawdown made boat access difficult. Some fish may have escaped deteriorating reservoir conditions by passing downstream via outlet structures.

TEXT

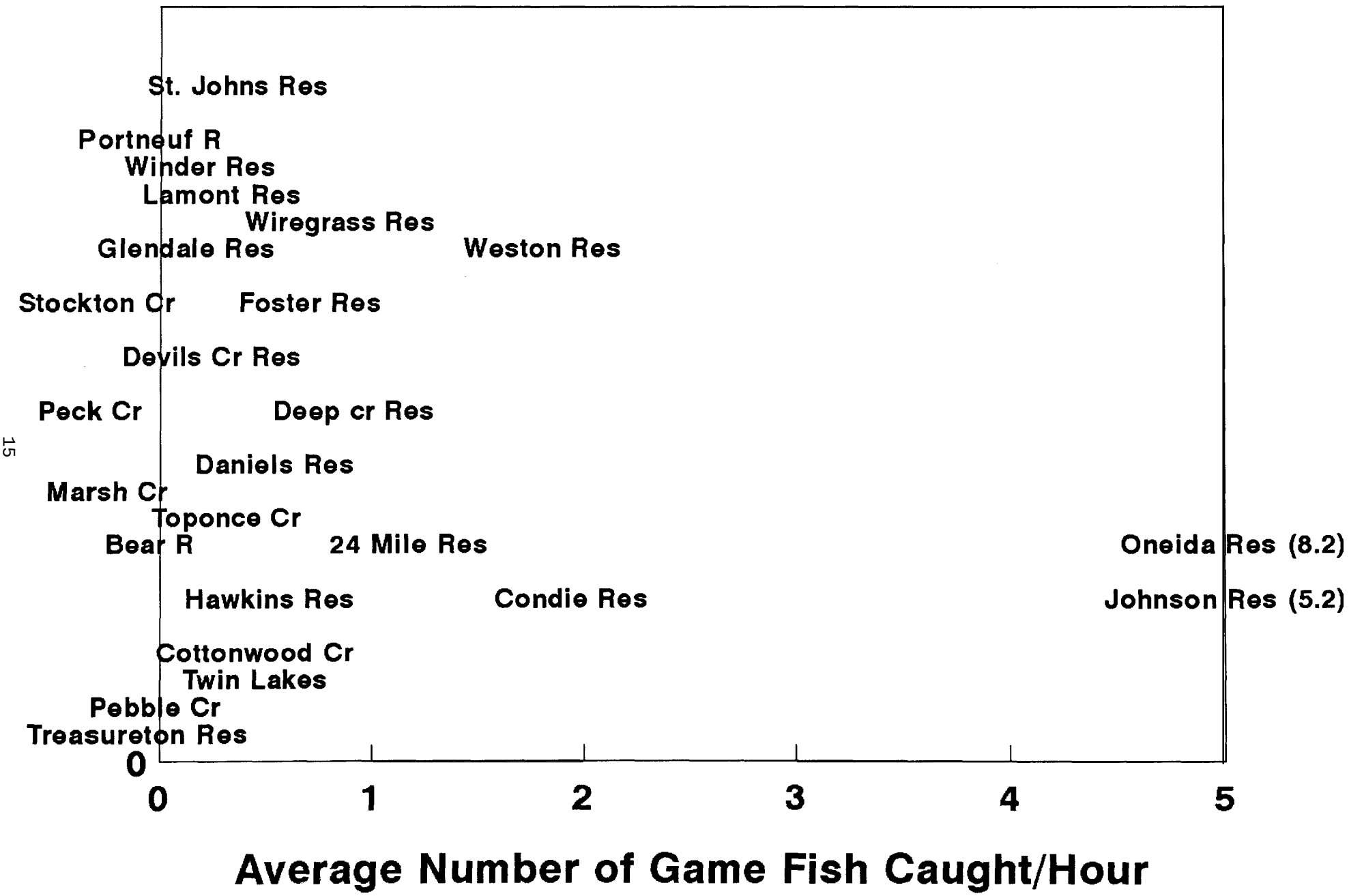

Figure 3. Average number of game fish caught/hour from spot creel checks on several Region 5 waters, 1990.

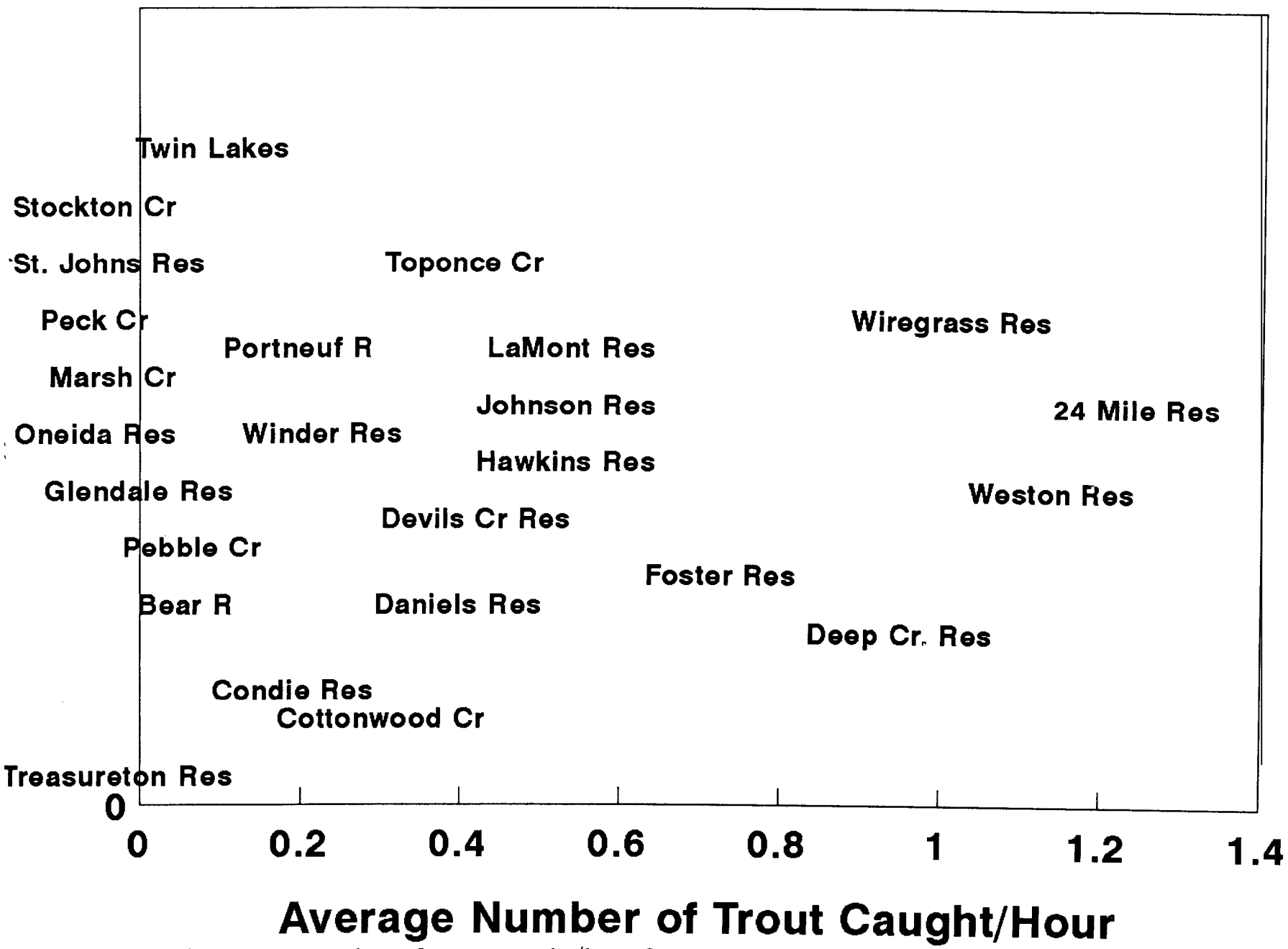

Figure 4. Average number of trout caught/hour from spot creel checks on several Region 5 waters, 1990.

Table 5. Anglers interviewed, hours fished, fish harvested, and harvest rates based on conservation officer checks during routine patrols of 965 anglers from 18 reservoirs in Region 5, 1990.

Reservoir-month	No. of Anglers Interviewed N	% Res	% Non-Res	Hours fished	Fish harvested HRB	WRB	CUT	Perch	LMB	Blgll	BRNT	Harvest rates Fish/h	
Condie Reservoir													
Jan	4	0	100	15	4	0	0	0	0	0	0	0.3	0.3
Apr	'3	92	8	39.5	4	0	0	0	0	0	0	0.2	0.2
Mav	lL2	41	59	178.5	50	0	0	21	11	63	0	0.8	0.3
Jun	19	84	16	44	16	0	0	10	0	73	0	2.3	0.4
Jul	40	53	47	119	0	0	0	67	11	407	0	4.1	0
Total	178	51	149	396	76	0	0	98	22	543	0	1.9	0.2
Daniels Reservoir													
Jun	45	51	49	140	61	0	0	0	0	0	0	0.4	0.4
Jul	11	55	45	42	8	0	0	0	0	0	0	0.2	0.2
Aug	18	28	72	61	41	0	0	0	0	0	0	0.7	0.7
Sep	24	100	0	93.5	19	0	0	0	0	0	0	0.2	0.2
Total	98	59	41	336.5	**129**	0	0	0	0	0	0	0.4	0.4
Deep Creek Reservoir													
Jan	3	100	0	7	3	0	0	0	0	0	0	0.4	0.4
Aug	12	42	0	55	50	0	0	0	1	0	0	0.9	0.9
Total	15	53	47	62	53	0	0	0	1	0	0	0.9	0.9
Devils Creek Reservoir													
Aug	20	35	65	62.5	25	0	0	0	0	0	0	0.4	0.4
Total	20	35	65	62.5	25	0	0	0	0	0	0	0.4	0.4
Foster Reservoir													
Jan	13	62	38	16.5	17	0	0	0	0	0	0	1.0	1.0
Mar	3	0	100	6	0	0	1	0	0	0	0	0.2	0.2
Jun	2	50	50	2.5	1	0	0	0	0	0	0	0.4	0.4
Total	18	50	50	25	18	0	1	0	0	0	0	0.8	0.7

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Table 5. Continued.

Reservoir-month	No. of Anglers Interviewed N	% Res	% Non-Res	Hours fished	Fish harvested HRB	WRB	CUT	Perch	LMB	Bluegill	BRNT	Harvest rates Fish/h	
Glendale Reservoir													
Jun	10	70	30	27	1	0	0	0	6	0	0	0.3	<0.1
Total	10	70	30	27	1	0	0	0	6	0	0	0.3	<0.1
Hawkins Reservoir													
Apr	11	100	0	30	1	0	0	0	0	0	0	<0.1	<0.1
May	63	94	6	157	78	0	0	0	0	0	0	0.5	0.5
Jun	53	100	0	149	55	0	0	0	0	0	0	0.4	0.4
Jul	82	100	0	146	55	0	0	0	0	0	0	0.4	0.4
Aug	40	90	10	125.5	58	0	0	0	0	0	0	0.5	0.5
Sep	31	94	6	76.5	106	0	0	0	0	0	0	1.4	1.4
Total	280	97	3	684	353	0	0	0	0	0	0	0.5	0.5
Johnson Reservoir													
Jan	25	64	36	41	36	0	0	161	0	3	0	4.9	0.9
Feb	46	83	17	86.5	11	0	0	459	0	0	0	5.4	0.1
Apr	7	43	57	5	14	0	0	0	0	0	0	2.8	2.8
Total	78	72	28	132.5	61	0	0	620	0	3	0	5.2	0.5
LaMont Reservoir													
Jan	2	50	50	4	2	0	0	0	0	0	0	0.5	0.5
Total	2	50	50	4	2	0	0	0	0	0	0	0.5	0.5
Oneida Reservoir													
Feb	3	100	0	7	0	0	0	60	0	0	0	8.6	0
Total	3	100	0	7	0	0	0	60	0	0	0	8.6	0

SECBTBLH

Table 5. Continued.

Reservoir-month	No. of Anglers Interviewed N	% Res	% Non-Res	Hours fished	Fish harvested HRB	WRB	CUT	Perch	LMB	Blgll	BRNT	Harvest rates Fish/h	
St. Johns Reservoir													
Jun	33	12	88	60	0	0	0	3	5	13	0	0.4	0
Jul	7	71	29	30.5	0	0	0	8	3	9	0	0.7	0
Total	40	85	15	90.5	0	0	0	11	8	22	0	0.5	0
Treasureton Reservoir													
Jun	10	100	0	17	0	0	0	0	0	0	0	0	0
Total	10	100	0	17	0	0	0	0	0	0	0	0	0
Twenty-four Mile Reservoir													
May	17	88	12	24	16	0	0	0	0	0	0	0.7	0.7
Jun	18	94	6	35	50	0	0	0	0	0	0	1.4	1.4
Jul	16	100	0	38.5	2	0	0	0	0	0	0	0.1	0.1
Aug	5	100	0	18	67	0	0	0	0	0	0	3.7	3.7
Sep	2	100	0	4	5	0	0	0	0	0	0	1.3	1.3
Total	58	87	12	119.5	140	0	0	0	0	0	0	1.4	1.4
Twin Lakes													
Jan	22	100	0	17.5	6	0	0	0	0	0	0	0.3	0.3
Feb	16	94	6	17.5	0	0	0	0	0	75	0	4.3	0
Mar	5	100	0	20	1	0	0	0	0	0	0	<0.1	<0.1
Apr	59	71	29	134.5	5	0	0	0	5	0	0	0.1	0.1
Total	102	82	18	189.5	12	0	0	0	5	75	0	0.5	0.5
Weston Reservoir													
Jan	26	85	15	29.5	31	0	0	18	2	0	0	1.7	1.1
Total	26	85	15	29.5	31	0	0	18	2	0	0	1.7	1.1

SECBTBLH

Table 5. Continued.

Reservoir-month	No. of Anglers Interviewed N	% Res	% Non-Res	Hours fished	Fish harvested HRB	WRB	CUT	Perch	LMB	Blgll	BRNT	Harvest rates Fish/h	
Winder Reservoir													
Feb	2	100	0	0.5	0	0	0	0	0	0	0	0	0
Apr	4	50	50	1.5	0	0	0	0	1	0	0	0.7	0
Jun	7	100	0	5.5	0	0	0	0	0	0	0	0	0
Jul	8	50	50	7	1	0	0	0	0	1	0	0.3	0.1
Aug	4	50	50	0.5	2	0	0	0	0	0	0	4.0	4.0
Total	25	68	32	15	3	0	0	0	1	1	0	0.3	0.2
Wiregrass Reservoir													
Jul	2	100	0	1	1	0	0	0	0	0	0	1.0	1.0
Total	2	100	0	1	1	0	0	0	0	0	0	1.0	1.0

SECBTBLH

Largemouth Bass

We collected 213 LMB, most of which (82%) came from St. John's Reservoir. Ten percent of the catch in St. John's Reservoir exceeded 300 mm (Appendix F), similar to the 7% exceeding 300 mm noted by Schill (1990) for Winder Reservoir. A strong year class or classes at St. John's Reservoir, with a median size of 170 mm, greatly influenced this statistic. Mean length for St. John's LMB was 197 mm. The Proportional Stock Density (PSD), however, which is based on bass 200 mm and longer, was 46%. This is within the 40-60% range, generally considered optimum for bass yield-fisheries (Anderson, 1980). Very few LMB were collected from Weston (23) or Pleasantview (16) reservoirs. Mean LMB lengths were 222 mm from Weston Reservoir (Appendix G) and 377 mm from Pleasantview Reservoir (Appendix H).

We believe the low number of LMB captured is a result of cold surface waters causing bass to remain at greater depths, reducing their vulnerability to electrofishing.

Twenty-four Mile Reservoir, 1989

We estimated that anglers fished 13,725 hours, or 771 h/hectare (312 h/acre), on 17.8-hectare Twenty-four Mile Reservoir from May 27 through August 12, 1989. Total estimated harvest was 4,327 rainbow trout (243/hectare or 98/acre), of which 83% were hatchery trout and 17% were wild trout. Approximately 304 trout (7%) were released. Average catch rate was 0.31 fish/h. Mean length of hatchery and wild rainbow trout combined was 298 mm (Figure 5).

Of 1,181 individuals interviewed, 95% were Idaho residents. Most anglers fished from the bank (76%) and used bait (73%). We were unable to relate car counts to fishing effort due to mechanical failure of car counters.

Blackfoot Reservoir

Anglers spent 56,944 hours on 7285-hectare Blackfoot Reservoir (7.8 h/hectare or 3.2 h/acre) during summer, 1990 (Table 6, Figure 6). Total catch was 10,388 fish (1.4/hectare, 0.6/acre), 94% of which were hatchery rainbow trout. No weights were collected on these fish. Heimer and Schill (1988) reported the mean length and weight of hatchery rainbow trout harvested from Blackfoot Reservoir were 354 mm and 465 g, respectively. This represents a yield of approximately 0.62 kg/hectare. Bear Lake cutthroat accounted for 2.8% (287 fish) of the creel. Wild cutthroat trout (3.2% of the catch) were included in the catch rate but not in the harvest. Wild cutthroat trout must be released according to the 1990-1991 regulations (Appendix I). Approximately one wild cutthroat trout was caught per 57 acres of Blackfoot Reservoir during the entire survey season. Average catch rate was 0.18 fish/h. Since the last creel survey of Blackfoot Reservoir in 1979 (Thurow 1980), there has been a large decrease in

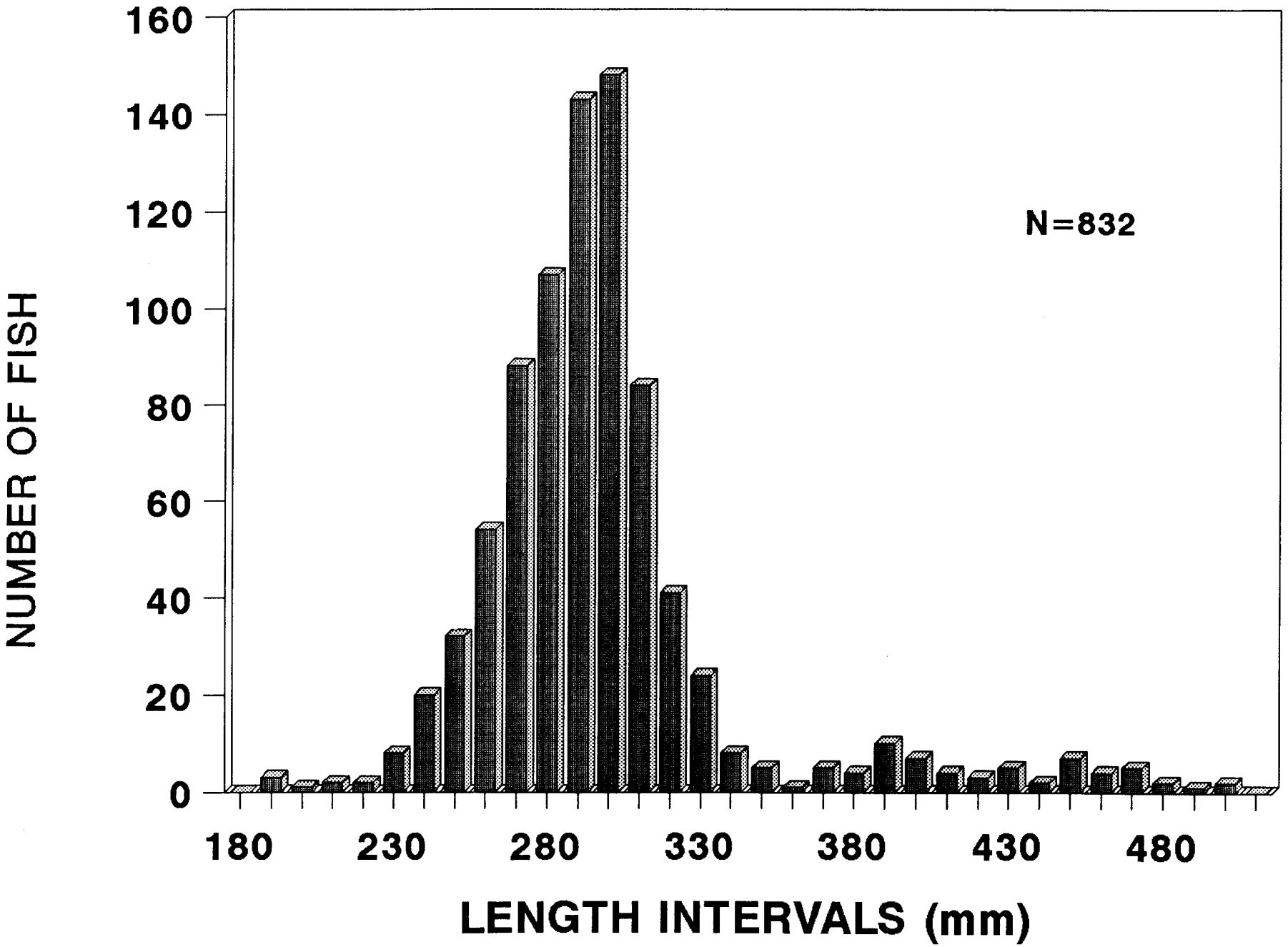

Figure 5. Length frequency distribution of hatchery rainbow trout caught by anglers on Twenty-four Mile Reservoir, 1989.

Table 6. Number of catchable size rainbow trout marked with reward tags in 1988 and 1989 and numbers returned in subsequent years in Region 5 waters.

Water	Number Marked	Year Marked	Number Returned 1988	1989	1990	unknown	Total Number	% Return
Reservoirs:								
Condie	150	1988	19	0	0	0	19	13
Glendale	150	1988	26	0	0	0	26	17
Twin Lakes	150	1988	9	0	0	0	9	6
Winder	150	1988	2	1	0	1	4	2
Blackfoot	100	1989	NT[a]	4	1	2	7	7
Deep Creek	200	1989	NT	25	4	4	33	17
St. Johns	100	1989	NT	9	1	0	10	10
Twenty-Four Mile	100	1989	NT	31	0	2	33	33
Weston	100	1989	NT	35	1	5	41	41
Rivers and Streams:								
Blackfoot (River)	197	1989	NT	21	0	1	22	11
Pebble Creek	100	1989	NT	17	1	2	20	20

[a]NT Indicates that 13 tagged fish were stocked.

SECBTBLH

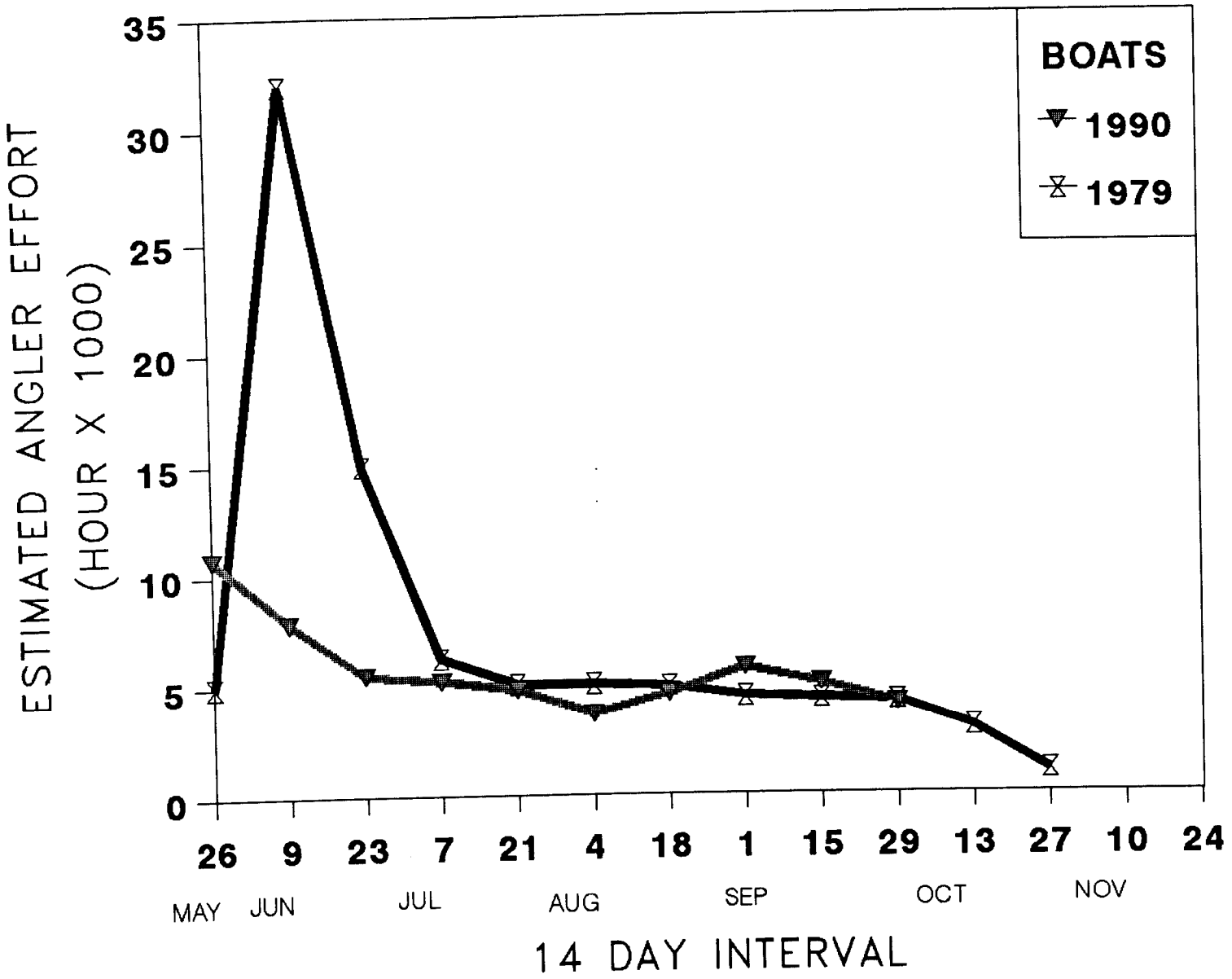

Figure 6. Estimated total effort of trout per 2-week intervals on Blackfoot Reservoir in 1979 (from Thurow) and 1990.

Table 7. Estimated total angler effort (hours), harvest, and catch rates on Blackfoot Reservoir, from May 26 to October 9, 1990.

Interval	Angler Hours	Hatchery Rainbow	Bear Lake Cutthroat	Wild Cutthroat[a]	Total	Average Trout/Hour
1	10,728	1,183	44	35	11,955	0.144
2	7,833	2,083	26	226	9,942	0.269
3	5,465	2,633	217	57	8,317	0.521
4	5,185	67	0	0	5,252	0.012
5	4,767	439	0	0	5,206	0.092
6	3,659	503	0	9	4,162	0.137
7	4,542	706	0	0	5,248	0.155
8	5,695	731	0	0	6,426	0.126
9	4,996	850	0	0	5,846	0.170
10	4,074	590	0	0	4,664	0.145

[a]No harvest.

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fishing effort during the first month of the season (Figure 6). It appears that fewer people came to Blackfoot Reservoir during the opening weekend in 1990, and due to low catch rates, few returned in the following weeks.

The relationship between angler effort and number of vehicles using Blackfoot Reservoir access roads was highly variable (r^2=0.25). Use of vehicle counters could not be used as an index of angling effort at Blackfoot Reservoir (Figure 1). Schill (1990) noted that areas receiving variable amounts of non-angler traffic probably would prove unsuitable for development of a statistically significant relationship between car counts and angling pressure. An area of this size probably is not a good candidate for this technique.

RECOMMENDATIONS

1. Collect physical and chemical data necessary to complete the fishery-potential inventory in Region 5 reservoirs.

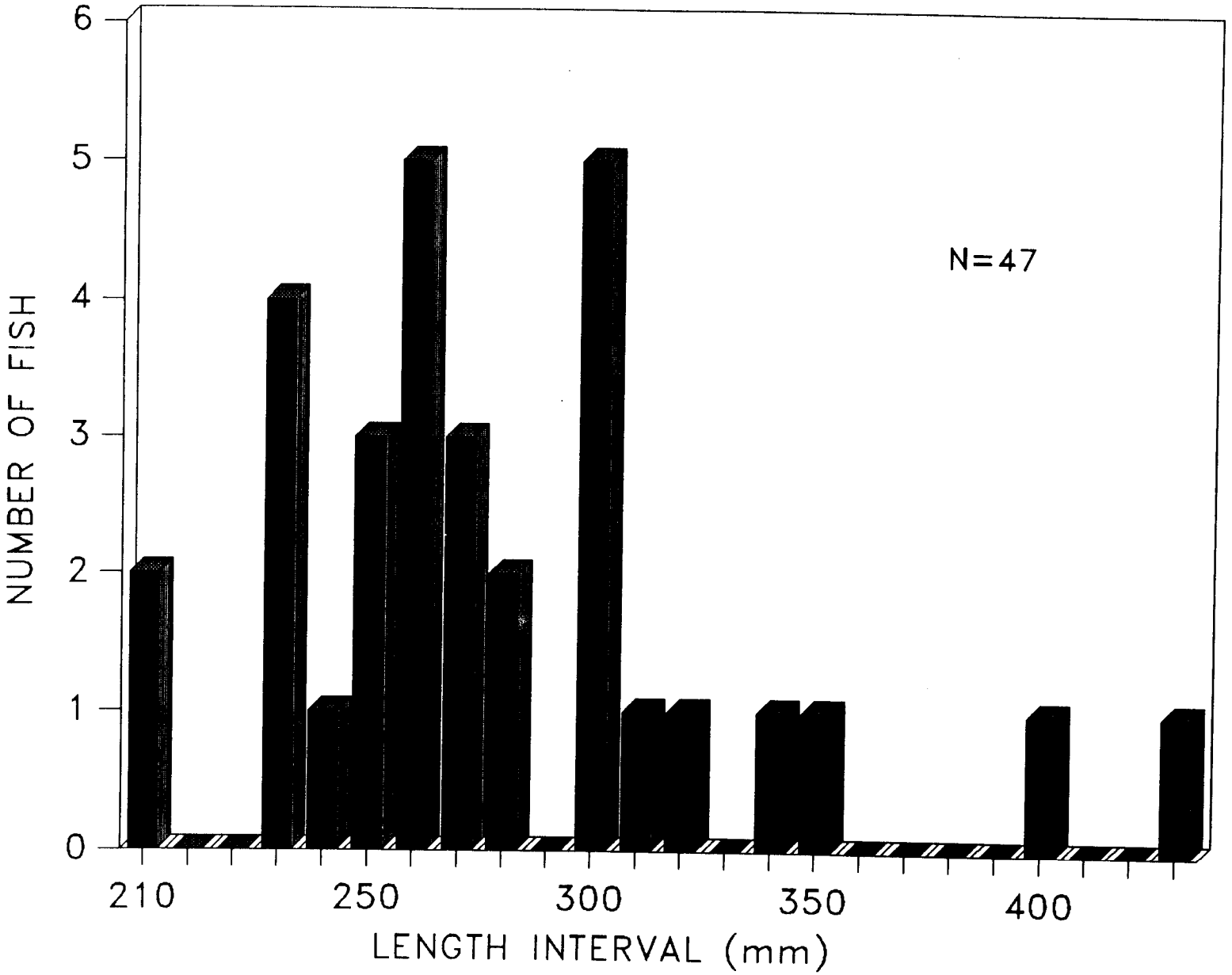
2. Evaluate the change in numbers and size structure of largemouth bass and bluegill in Region 5 waters where bass creel limits changed in 1990.

3. Discontinue return-to-the-creel evaluations on waters subject to drastic irrigation water drawdowns until precipitation returns to a more normal amount.

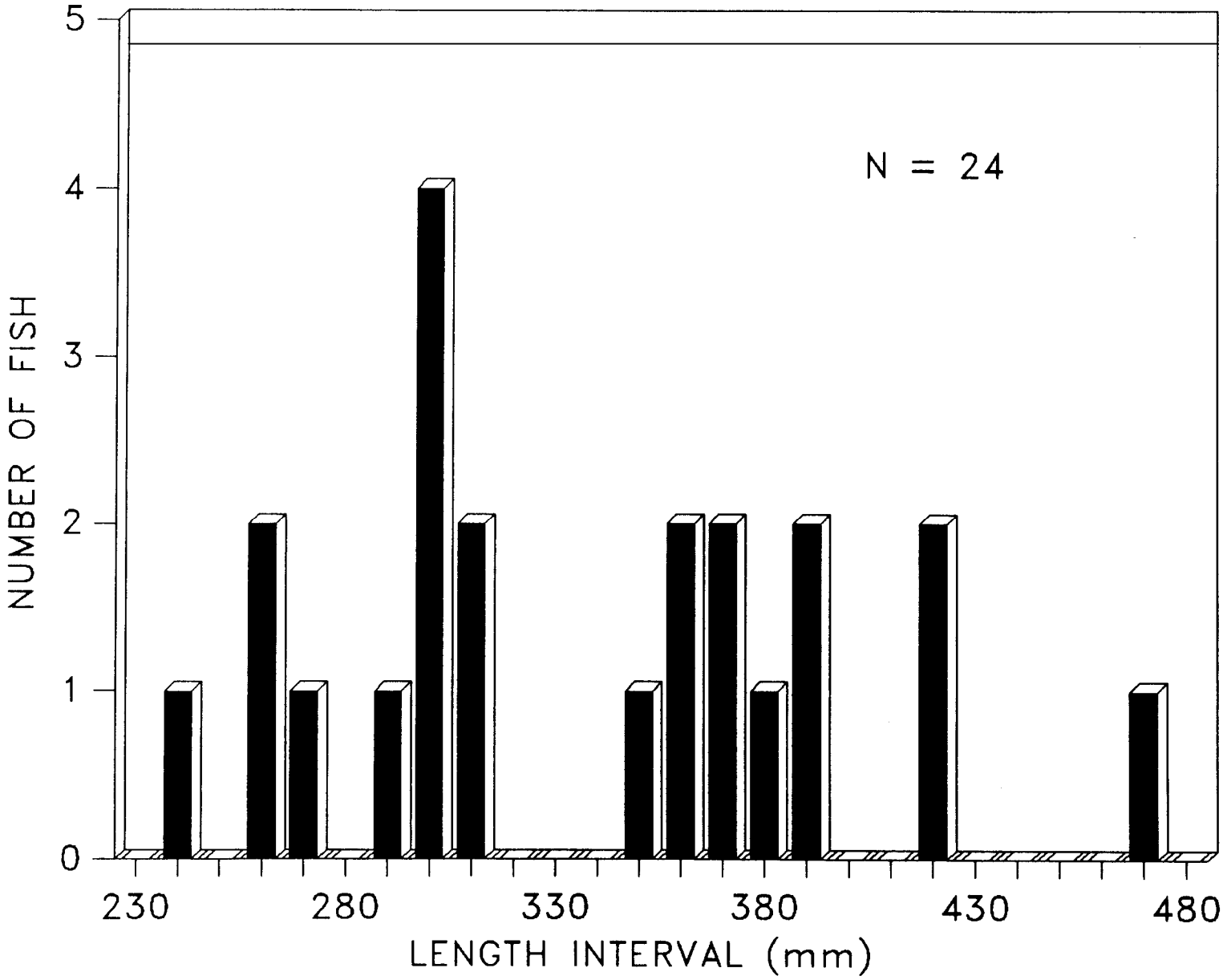
4. Collect additional years' data prior to major shifts in, or elimination of, catchable size trout stocking in Region 5 reservoirs.

TEXT

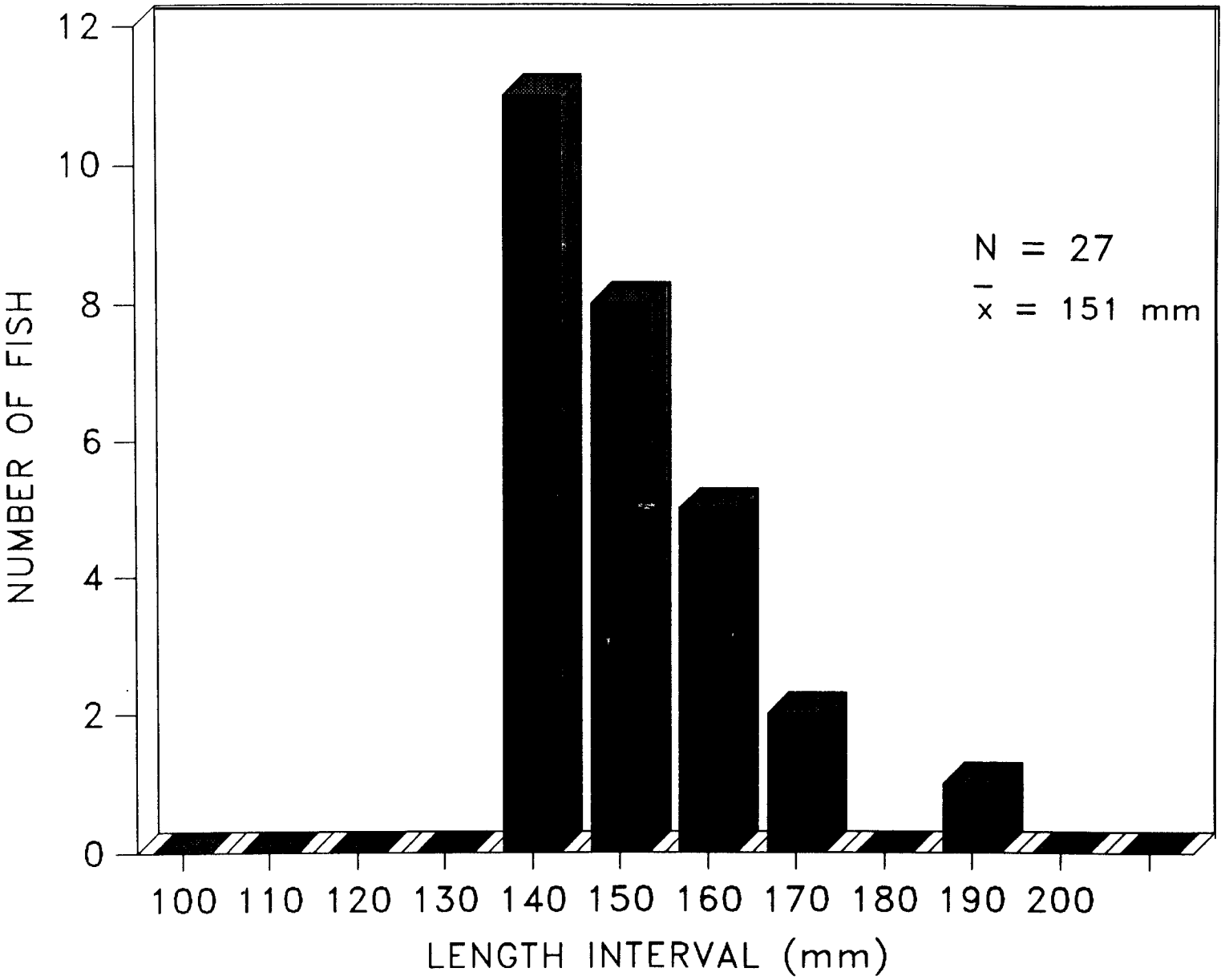
APPENDICES



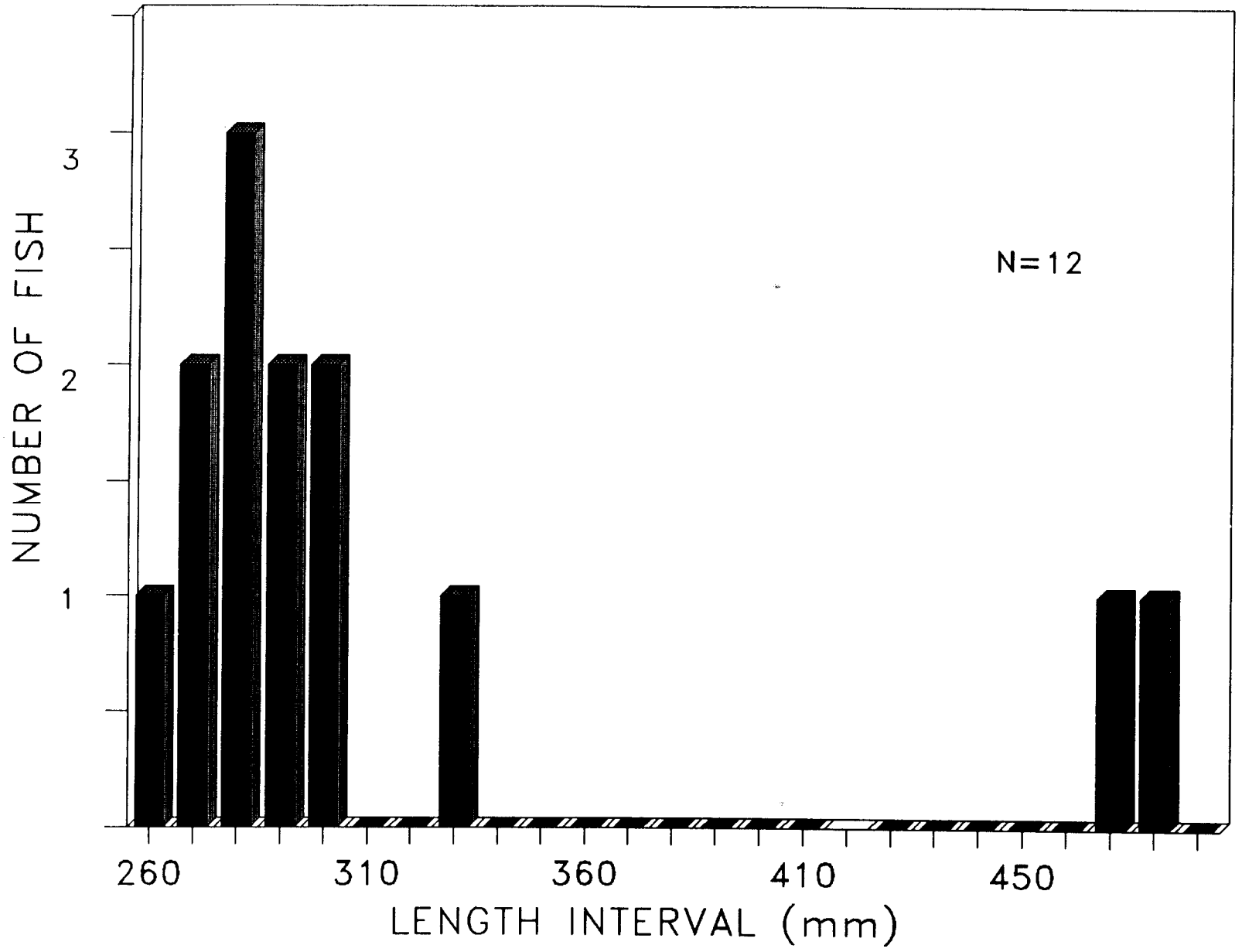
Appendix A. Length frequency distribution of hatchery rainbow trout caught by experimental gillnetting at Twenty-four Mile Reservoir, July 23, 1990.



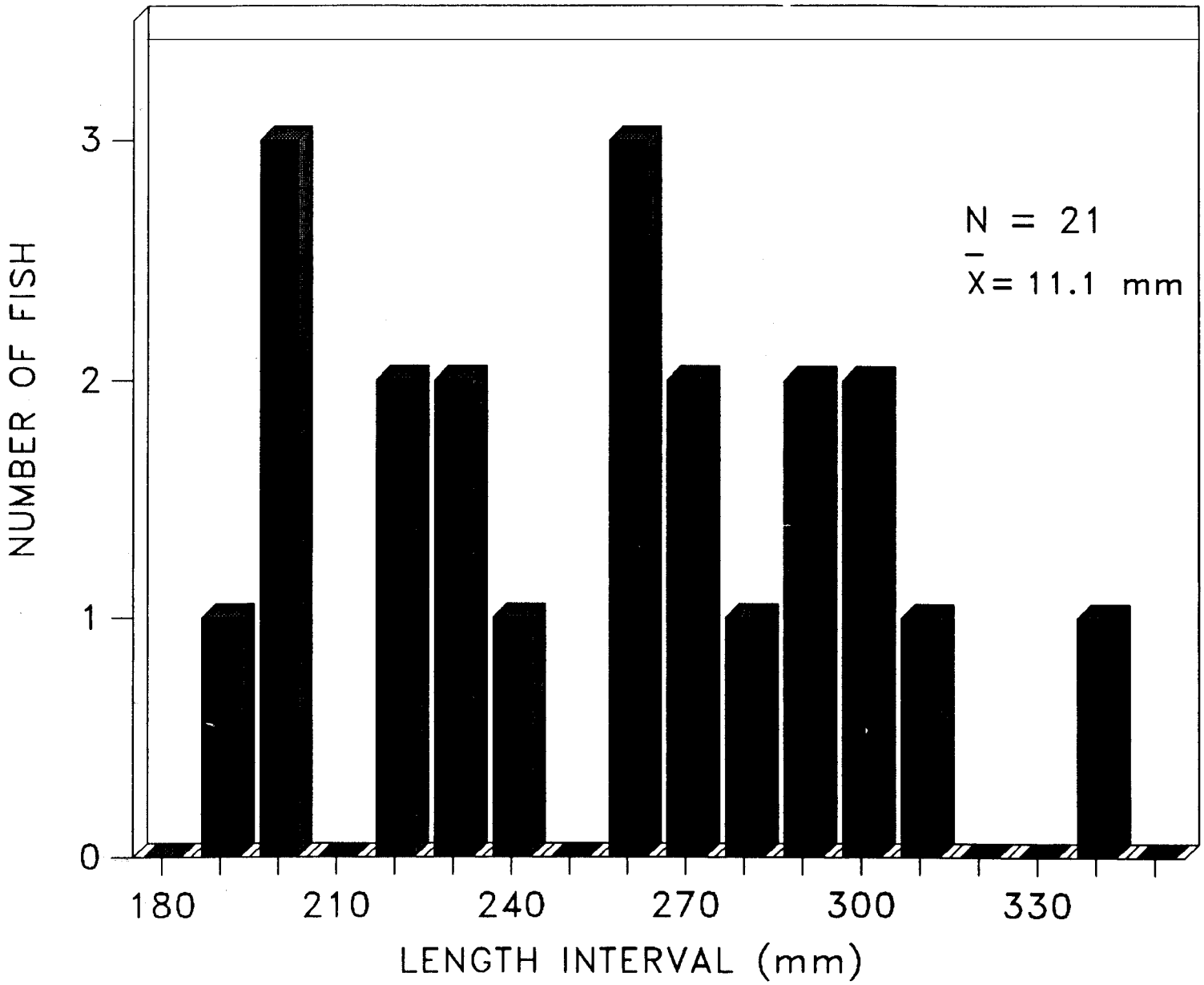
Appendix B. Length frequency distribution of hatchery rainbow trout caught by experimental gillnetting at Chesterfield Reservoir, July 23, 1990.



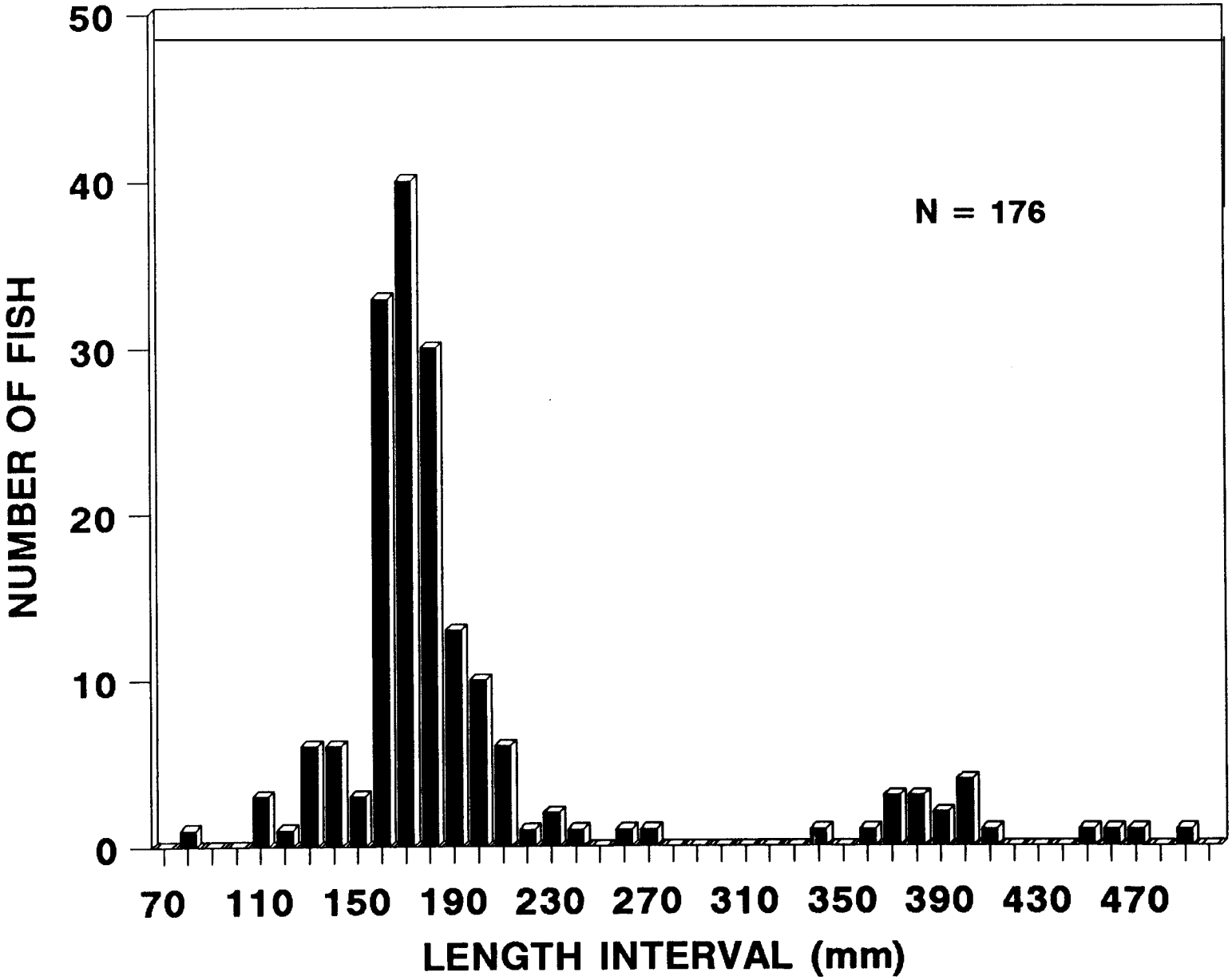
Appendix C. Length frequency distribution of yellow perch caught by experimental gillnetting at Montpelier Reservoir, July 27, 1990.



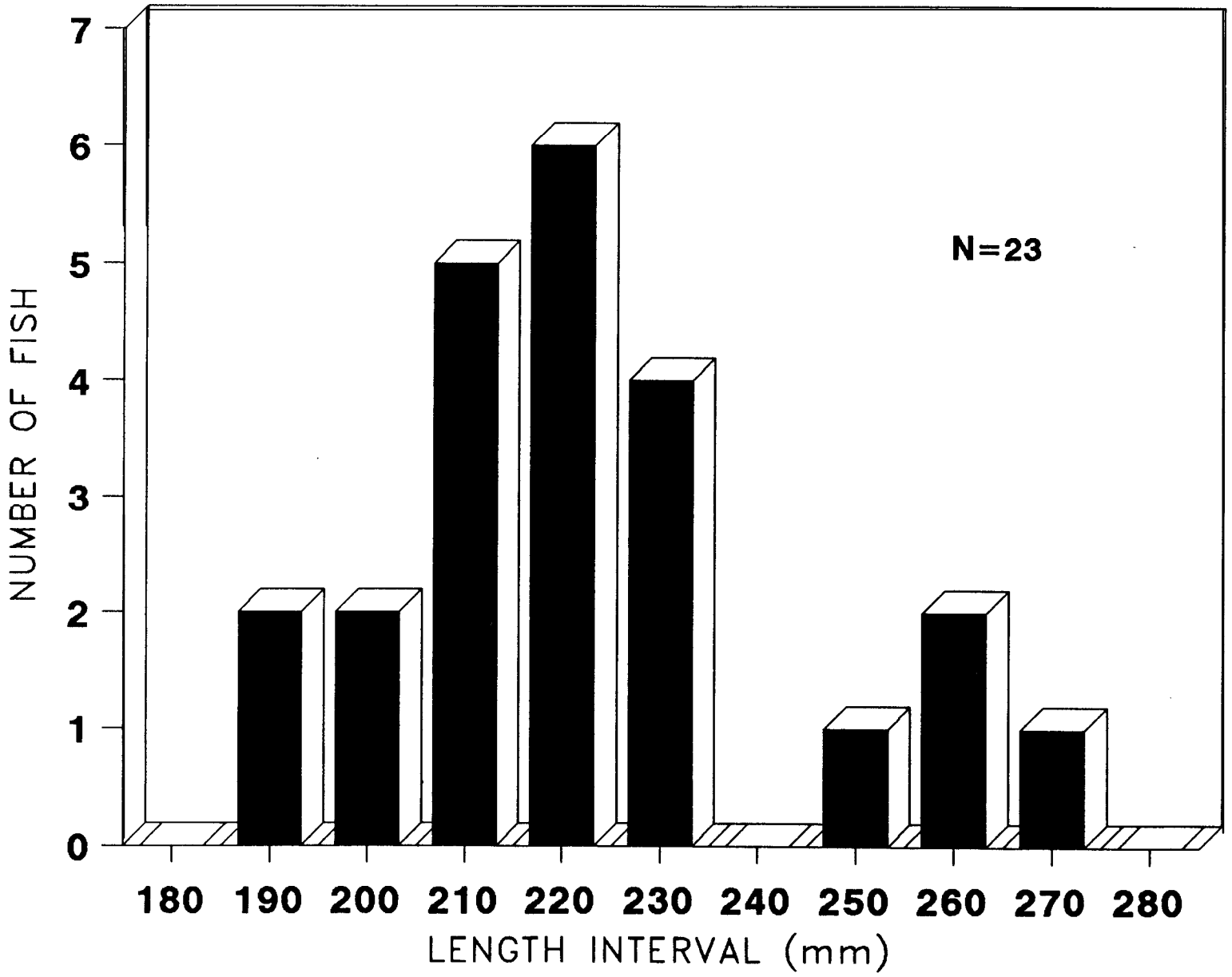
Appendix D. Length frequency distribution of hatchery rainbow trout caught by experimental gillnetting at Devils Creek Reservoir, August 21, 1990.



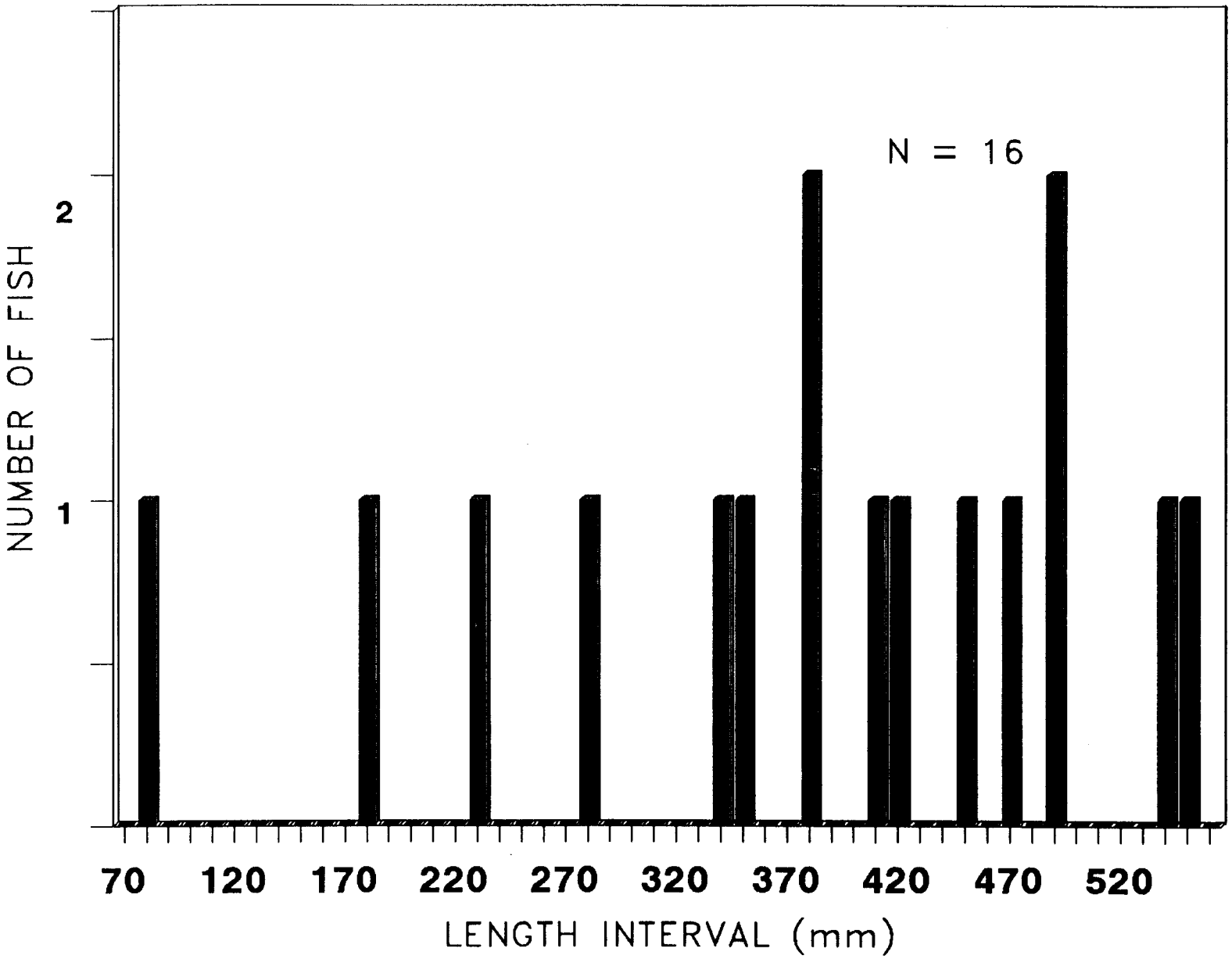
Appendix E. Length frequency distribution of rainbow/cutthroat trout caught by experimental gillnetting at Daniels Reservoir, August 7, 1990.



Appendix F. Length frequency distribution of largemouth bass sampled by electrofishing at St. John's Reservoir, May 1989.



Appendix G. Length frequency distribution of largemouth bass sampled by electrofishing at Weston Reservoir, May 1989.



Appendix H. Length frequency distribution of largemouth bass sampled by electrofishing at Pleasantview Reservoir, May 1989.

Appendix I. Estimated total angler hours, harvest, and catch rates by reservoir section, Blackfoot Reservoir, 1990.

Section	Angler hours	Hatchery rainbow	Bear Lake cutthroat	Wild cutthroat	Average trout/ Total hour
1 (upper)	30,225 (4,074)	4,359 0.14	4,258 (1,091)	86 (56)	15 (6)
2 (middle)	14,136 (2,847)	3,137 0.22	2,890 (913)	75 (101)	172 (177)
3 (lower)	12,583 (2,734)	2,892 0.23	2,619 (1,357)	133 (169)	140 (155)
Total	56,944 (5,672)	10,388 0.18	9,767 (1,967)	294 (205)	327 (235)

Number in parentheses () are 95% confidence limits expressed as a percent of the estimates.

JOB PERFORMANCE REPORT

State of: Idaho

Name: Regional Fisheries Management Investigations

Project No.: F-71-R-15

Title: Region 5 Rivers and Streams Investigations

Job No: 5-c

Period Covered: July 1, 1990 to June 30, 1991

ABSTRACT

Bonneville cutthroat trout parr densities continued to decline in the Thomas Fork of the Bear River's tributaries of Preuss, Giraffe and Dry creeks in 1990. Parr densities within the Preuss Creek livestock exclosure maintained higher parr densities than observed outside the exclosure, although differences were minor. The exclosure at Giraffe Creek has not shown consistent parr density benefits.

Although the Caribou National Forest has made changes in the grazing allotment management, beginning in 1987, there is no evidence of improvement in the heavily-degraded riparian zones and stream channels of Thomas Fork tributaries.

The continuing drought, which began in 1987, is no doubt a factor in the declining trout populations. However, drought conditions are greatly exacerbated where poor watershed and riparian management strip the environment of its ability to store limited water, shade streams, and maintain high water tables, all factors necessary to sustain trout populations during cycles of limited precipitation.

A floating weir was installed and operated at the sucker trap site on the upper Blackfoot River to monitor escapement of wild Yellowstone cutthroat trout to upper Blackfoot River spawning grounds. Wild cutthroat trout were passed upstream of the weir. Bear Lake cutthroat trout (an introduced subspecies) spawners were removed for artificial propagation. Rainbow trout were transported to Meadow Creek, a tributary to Blackfoot Reservoir. Several tons of mountain suckers were collected at the site and removed from the river.

TEXT

We electrofished two sections which comprised approximately 1 km^2 of the Snake River near Woodville, Idaho in October 1990. Mountain whitefish were the most numerous species captured, with an estimated population of 62,173 (6.2/100 m^2).

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TEXT

OBJECTIVES

1. Monitor Bonneville cutthroat trout population density in Giraffe and Preuss creeks.

2. Estimate opening day angler use and harvest on upper Blackfoot River.

3. Monitor escapement of adult Yellowstone cutthroat trout on upper Blackfoot River tributaries.

4. Assess status of fish populations in the Woodville section of the Snake River near Shelley, Idaho.

METHODS

Bonneville Cutthroat Trout Assessment

Wallace {1978 and 1980) determined that essentially pure Bonneville cutthroat trout populations, but with a trace of hybrid contamination from other Salmo species, inhabited upper Giraffe, Preuss and Dry creeks (Figure 1), tributaries to the Thomas Fork of the Bear River in southeast Idaho. This followed discovery by Behnke (1979) of Bonneville cutthroat trout within Wyoming's reach of the Thomas Fork system. To date, the Thomas Fork contains the only known populations of Bonneville cutthroat trout in Idaho. The Idaho Department of Fish and Game (IDFG) has monitored the status of Bonneville cutthroat trout since 1979 because of the limited distribution of this subspecies, and because of a concern for the effects livestock grazing have had on riparian and stream channel conditions throughout the Thomas Fork tributaries.

Department personnel have estimated fry (< 75 mm) and parr (≥ 76 mm) densities of Bonneville cutthroat trout in the Thomas Fork tributaries of Preuss, Giraffe and Dry creeks in most years since 1985. Additionally, limited fish density sampling was done in 1979 and 1981, shortly after the discovery of Bonneville cutthroat in Idaho waters. Cutthroat trout were collected with backpack shocking units. Cutthroat populations were estimated in measured stream sections using the Seber (Everhart et al. 1975) two-pass removal technique. After the two passes were complete in a given section, fish were measured and released to the stream near the site of collection. Data from each pass were recorded separately.

Upper Blackfoot River

Opening Day Creel Survey

The upper Blackfoot River opened for angling on July 1, 1990. The check station at the sucker trap was not operated in 1990. A roving angler survey was

TEXT

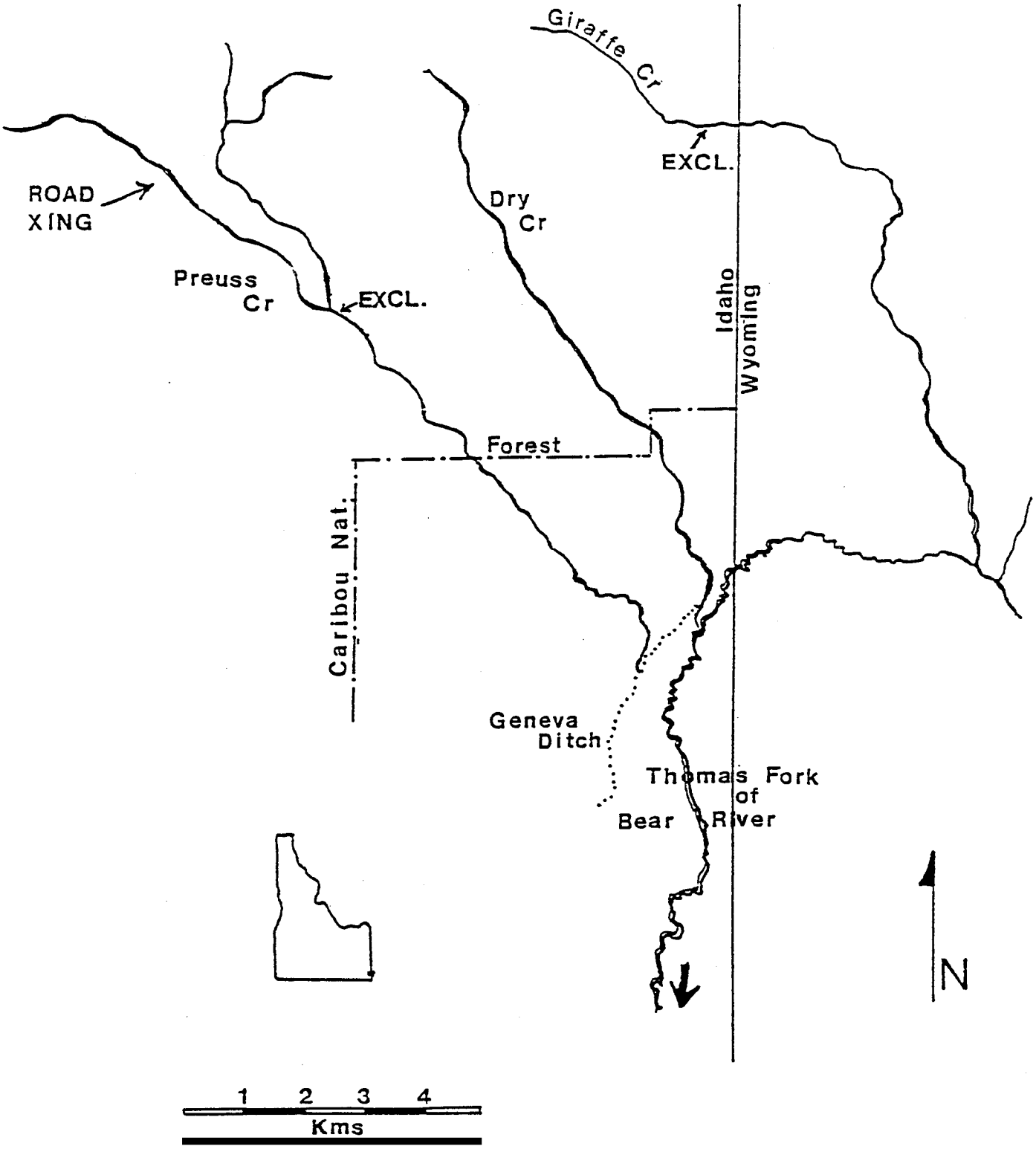

Figure 1. Map of the Thomas Fork drainage showing exclosures on Giraffe and Preuss creeks.

conducted on the July 1 river opener. The upper Blackfoot River was surveyed from its confluence with Blackfoot Reservoir upstream to Lone Pine Spring, **a** distance of 46 kms.

Sucker Trap Operation

A floating weir and fish trap were operated at the "sucker trap" on the upper Blackfoot River, 1.8 kms upriver from Blackfoot Reservoir. The facility was operated by employees of a commercial rough fish company who were supervised by Grace Fish Hatchery personnel. Rough fish were removed from the trap. Trout were kept for Grace Fish Hatchery personnel to count and sort by species and strains. Wild cutthroat trout were released upriver to spawn.

Evaluation of the Woodville Section of the Snake River

Regions 5 and 6 fisheries personnel surveyed the Woodville reach of the Snake River to estimate population size and length frequency distributions of mountain whitefish and rainbow, brown, and cutthroat trout. The upper section began 1,000 m downstream of the Lower Power Plant and extended approximately 4 km (2.5 mi) downstream (Figure 2). The lower section began 4.5 km (2.8 mi) upstream of the Shelly Bridge and ended at the bridge. The combined area sampled was 1.0 km^2 (0.4 mi^2). Two boats with boom-mounted electrofishing equipment were used in parallel. The Peterson/Lincoln method was used, with fish being marked on October 24 and 25, 1990 and recaptured on October 31, 1990.

Catch Rates from Region 5 Fisheries (Spot Creel Checks)

Conservation officers and fishery personnel collected catch rate and catch composition information at several Region 5 rivers and streams in 1990. These data were collected during routine officer patrols or while conducting various fishing surveys. Anglers were typically checked before they had completed angling.

RESULTS

Bonneville Cutthroat Trout Assessment

In 1979, only one section was sampled in the Thomas Fork tributaries, and that was in Giraffe Creek. Parr density, as number/100 m^2, was low (4.4). Average parr densities in 1981, based on two samples each from Preuss and Giraffe creeks, was slightly higher at 6.7/100 m^2. In the mid-1980s, 1985, 1986 and 1987, parr densities were much higher, averaging 26.1, 18.3, and 18.1, respectively. Densities measured more recently, in 1989 and 1990, have substantially decreased, with average values of 14.4 and 6.0, respectively

TEXT

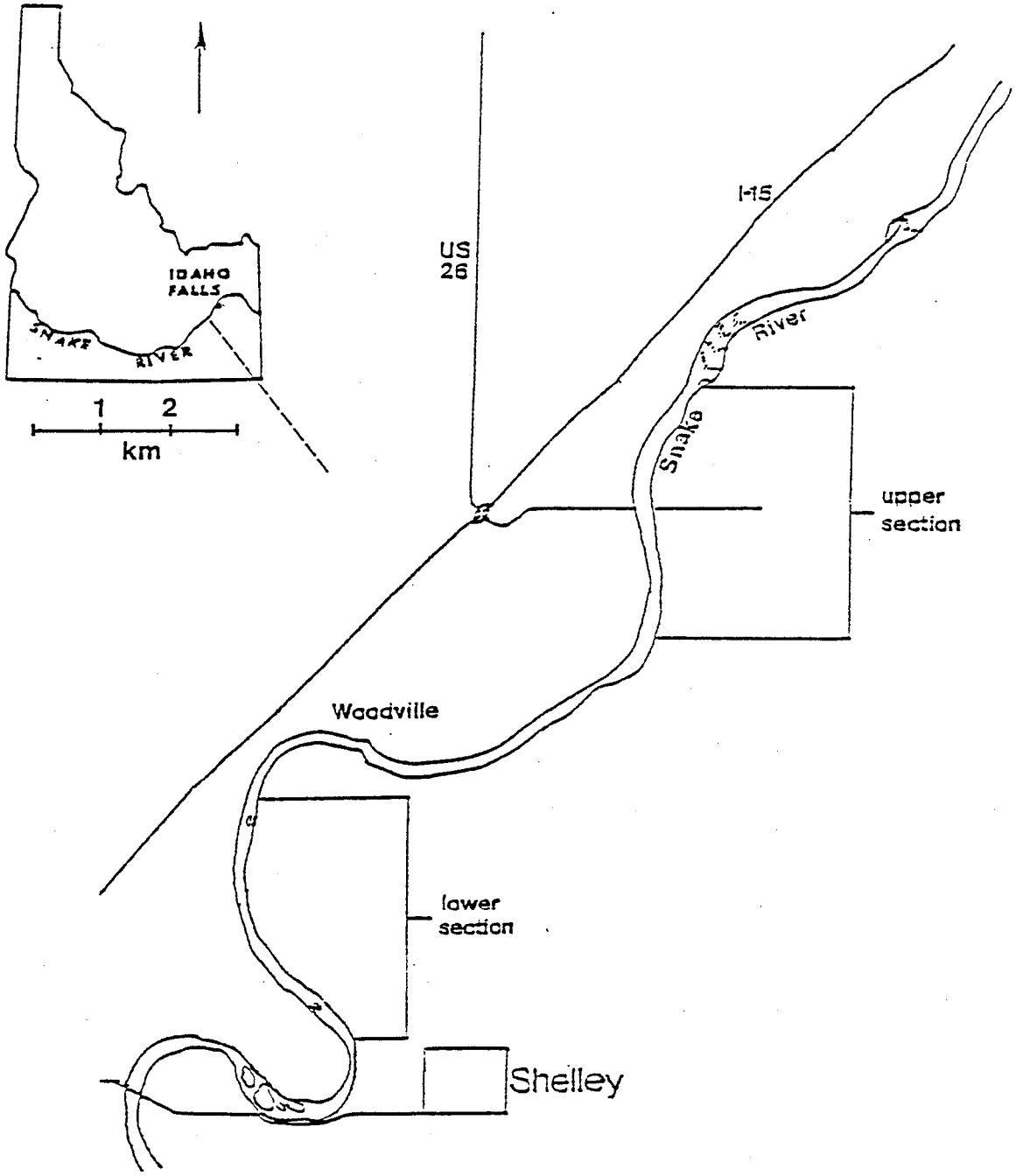

Figure 2. Map of Snake River from Idaho Falls, Idaho to Shelly, Idaho showing sections electrofished, October 24-25 and 30, 1990.

(Tables 1-3). The trend in fry density was similar to that of parr densities (Table 4). However, fry densities experienced more dramatic changes than have parr densities, since number of fry is dependent on a single year's conditions, whereas parr numbers, which are composed of more than one year class, reflect average conditions over several years. Some of the sections sampled have consistently had no fry. Fry production is probably restricted to areas of medium gradient, where the predominant substrate is gravel rather than fine sediments. Preuss Creek, section PCK-4, appears to be in such a spawning area. Sampling prior to August may be too early for fry emergence.

We estimated the amount of spawning gravel in a 3,025 m reach of Preuss Creek immediately above the Crow Creek Road crossing. This area includes section PCK-4. Spawning gravel areas totaled 26,239 m^2. Individual gravel areas averaged 2.3 m^2.

Density comparisons between inside and outside of exclosures averaged 8% higher outside the Giraffe Creek exclosure than inside and 31% lower outside the Preuss Creek exclosure than inside (Tables 1-3). There was much year to year variation in the annual comparisons in Giraffe Creek. Significant fish density differences should not be expected between the unprotected stream and small exclosures. Although there is obvious improvement in the riparian condition within exclosures, the exclosures are short and, thus, bedload and suspended sediment, as well as water temperature measurements within exclosures, would not be expected to differ from measurements taken outside the exclosures.

The U.S. Forest Service and IDFG personnel toured the Bonneville cutthroat trout streams in September 1990, inspecting much of the lower stream reaches. The consensus was that riparian and channel habitat conditions deteriorated significantly over the last several years. The combination of questionable grazing practices coupled with severe drought conditions continued to negatively impact the drainage. A coordinated Resource Management Plan for the Montpelier-Elk Valley grazing allotment, scheduled for completion in 1992, may provide mechanisms for reversing this trend.

Habitat data collected by the Caribou National Forest during the last decade demonstrate that the riparian and streambed condition of Preuss, Dry, and Giraffe creeks are generally in poor to fair condition, especially in the low gradient meadow sections. There is substantial opportunity to improve riparian and floodplain management for the benefit of fish, wildlife, and water quality and quantity. Bonneville cutthroat trout, considered a species of special concern by IDFG and a sensitive species by the Caribou National Forest, should receive priority consideration in multiple use management. Streams which are wide and shallow, exposed to direct sunlight over most of the surface area, and are heavily sedimented cannot produce nor support nearly the number of fish as can streams with robust riparian plant communities.

Annual precipitation has varied widely during the period of study. In 1977, peak discharge in the Thomas Fork was one of the lowest on record at 37 ft^3/s (Figure 3). In contrast, peak discharge in 1984 was 1,450 ft^3/s, the highest discharge on record. In general, medium to low flows occurred in the late 1970s and early 1980s followed by high to extremely high water years in the

Table 1. Fry (≤ 75 mm) and parr (≥76 mm) densities in sections of Giraffe Creek, between 1979 and 1990.

Section code	Location	Date	Section length (m)	Section area (m^2)	Fry per 100	Parr per$_k$ 100 m^2
GCK-1	Within Exclosure	07/31/79	141	297.5	0.0	44
		10/09/86	132	246.8	0.0	214
		10/07/87	132	278.5	0.0	327
		10/20/89	132	262.7	0.0	190
		09/25/90	132	262.7	0.0	141
GCK-2	Above Exclosure	09/03/81	150	505.5	0.0	02
		10/09/86	155	265.1	0.0	191
		10/08/87	155	249.9	0.0	415
		10/20/89	155	257.4	0.0	339
		09/17/90	155	257.4	0.0	55
GCK-3	Below Exclosure	09/03/81	100	337	0.0	42
		09/17/90	155	249.7	0.0	44

Table 2. Fry (≤ 75 mm) and parr (≥ 76 mm) densities in sections of Dry Creek, between 1987 and 1990.

Section code	Location	Date	Section length (m)	Section area (m^2)	Fry per 100 m^2	Parr per 100 m^2
DCK-1	End of Road from bottom	08/21/87	91.4	209.3	2.9	14.4
		10/11/90	91.4	209.3	0.0	4.3

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Table 3. Fry (≤ 75 mm) and parr (≥ 76 mm) densities in sections of Preuss Creek, between 1981 and 1990.

Section code	Location	Date	Section length (m)	Section area (m^e)	Fry per 100 m^2	Parr per 100 m^2
PCK-3	Within exclosure	09/02/81	125	251.3	0.0	16.3
		10/15/85	119.8	240.8	12.2	31.6
		10/07/86	105	273	2.2	17.5
		08/13/87	130	261.3	3.2	14.2
		10/07/87	129.7	260.7	1.2	15.7
		10/19/89	130	260.7	0.4	2.7
		09/18/90	130	260.7	0.0	3.5
PCK-2	Below Exclosure	09/02/81	125	258.8	0.3	6.2
		10/15/85	131.1	271.4	11.8	20.5
		10/07/86	131.1	321.1	4.5	15.0
		08/13/87	142	293.9	3.2	14.2
		10/07/87	142	293.9	1.8	9.3
		10/19/89	142	293.9	0.7	2.0
		09/18/90	142	293.9	0.0	3.1
PCK-1	Near USFS Boundary	08/22/87	108.4	290.5	0.0	7.0
PCK-4	200 m above Crow Creek Road	10/10/90	184	311	8.0	6.8

Table 4. Parr (> 76 mm) densities within and outside livestock exciosures on Giraffe and Preuss creeks from 1981 to 1990.

Stream	Year	Densities (number/100 m^2) Exclosure	Outside	Density difference	Percent difference
Giraffe	1986	21.4	19.1	- 2.3	-11
	1987	32.7	41.5	+ 8.8	+27
	1989	19.0	33.9	+14.8	+78
	1990	14.1	5.5	- 8.6	-61
Preuss	1981	16.3	6.2	-10.1	-62
	1985	31.6	20.5	-11.1	-35
	1986	17.5	15.1	+30.6	-14
(Aug.)	1987	15.7	9.3	- 6.4	-41
(Oct.)	1987	14.2	10.1	-	-29
	1989	2.6	2.0	- 0.6	-23
	1990	3.5	3.1	- 0.4	-11

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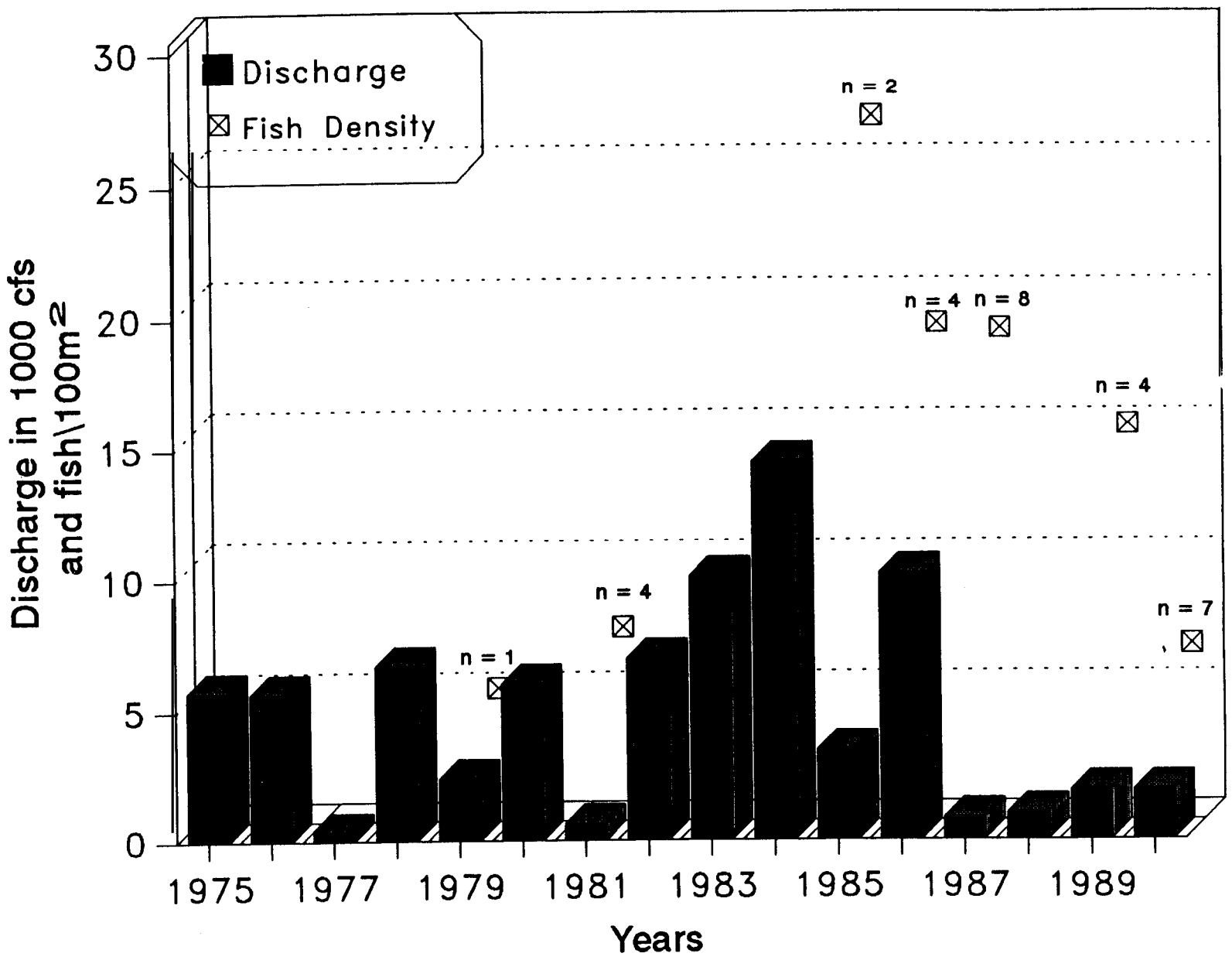

Figure 3. Discharge (x 1,000 ft^3/s) and average densities (fish/100 m^2) in the Thomas Fork River drainage.

mid-1980s. The late 1980s and 1990 were medium to low water years, with 1988 through 1990 being considered drought years throughout southeast Idaho. To some extent, fish densities have mirrored this trend, with low densities in 1979 and 1981, higher densities in the mid-1980s, and rapidly decreasing densities by 1990. Wyoming Department of Game and Fish (Ron Remmick, personal communication) has reported similar fish population trends in Huff Creek, tributary to the Thomas Fork, during the 1980-1990 interval. While we believe that quantity of precipitation directly influences fish populations in headwater streams, there is ample evidence that hydrographs can be effected by watershed and riparian quality. Watersheds and riparian zones in good condition store water and release it slowly throughout the year, whereas watersheds and riparian zones that have been degraded by grazing, logging, or other land use practices allow water to run off rapidly. Little water is stored for later release. In ephemeral streams, where riparian conditions have been restored, intermittent flows have become perennial (Chaney et al. 1990); rehabilitated perennial streams will increase base flows. The population of Idaho's Bonneville cutthroat trout would be in better condition, even during drought years, if more vegetation existed in the watershed, especially in riparian areas.

Upper Blackfoot River

Opening Day Creel Survey

Thirty anglers fished 84 hours to catch 28 trout at 0.33 fish/h. Species composition was 100% Yellowstone cutthroat trout. The fish were not measured or weighed. Most effort occurred along Diamond Creek. Mean catch per km of river was 0.6 fish/km.

Sucker Trap Operation

A floating weir was operated at the sucker trap on the upper Blackfoot River, April through June 1990. Approximately 750 cutthroat trout were collected and passed above the weir. Several tons of mountain suckers were collected and hauled away.

Evaluation of Woodville Section of Snake River

Due to the small number of marked fish recaptured, we combined data from the two sections sampled and made a single population estimate. Eighteen percent of hatchery rainbow trout collected were considered "holdovers" from previous years' catchable plantings. Whitefish were the most numerous game fish in 1990, as in 1987 (Lukens 1988). We collected 2,414 whitefish, 4% of the estimated population of 62,173 (95% CLs = 45,567 and 100,546), with a density of 6.2 fish/100 m^2. We estimated the population of rainbow trout (hatchery and wild

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combined) to be 803 fish (95% CLs = 353 and 2041) with a density of 0.08/100 m^2. Wild and hatchery rainbow trout accounted for 3.4% and 67.9% of the species composition of trout collected, respectively. We estimated the population of brown trout to be 108 fish (95% CLs = 61 and 471) at a density of 0.01/100 m^2. Brown trout comprised 28.7% of the trout species composition. Only two wild cutthroat trout were collected.

Lukens' (1988) estimates of populations and densities for each species (Table 5) were very similar to those reported here. Lukens hypothesized that the brown trout population in this river section was recruitment limited due to lack of spawning habitat. Our observations of very few juvenile brown trout during the 1990 survey supports this hypothesis.

Length frequency distributions by species are presented in Appendices J-L.

Catch Rates from Region 5 Fisheries (Spot Creel Checks)

Highest trout catch rates in streams were in Cottonwood and Toponce creeks at 0.3 and 0.4 trout/h, respectively (Table 6, Figures 4 and 5).

RECOMMENDATIONS

1. Continue June spawning ground surveys on the upper Blackfoot River.
2. Estimate opening day angler use and harvest on the upper Blackfoot River.
3. Monitor escapement of adult yellowstone cutthroat trout on the upper Blackfoot River tributaries.
4. Evaluate effects of Area 6 cutthroat trout slot limits, implemented in 1990, on stream fisheries in Region 5.
5. Assess status of fish populations in the Woodville section of the Snake River near Shelley, Idaho.

Table 5. Electrofishing results from the Woodville section of the Snake River 1987, (from Lukens 1988) and 1990.

	Population estimate by species and associated 95% confidence limits		Fish/100 m^2	
	1987 Sample area = 15.0	1990 Sample area = 100 ha	1987	1990
Whitefish	10,191 (4,348 and 24,036)	62,173 (45,127 and 100,546)	7.2	6.2
Trout[a]	126 (73 and 215)	803 (353 and 2041)	0.07	0.08
Rainbow[b]		595 (351 and 1940)		0.05
Browns		108 (61 and 471)	0.07	0.01

[a] All trout species combined.
[b] Hatchery and wild rainbow trout combined.

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Table 6. Anglers interviewed, hours fished, fish harvested, and catch rates based on conservation officer checks during routine patrols of 232 anglers from 8 rivers and streams in Region 5, 1990.

River or Stream-month	No. of Anglers Interviewed N	% Res	% Non-Res	Hours fished	Fish harvested HRB	WRB	CUT	Perch	LMB	Blgll	BRNT	Catch rates Fish/h	Trout/h
Bear River													
Feb	1	100	0	0.5	0	0	0	0	0	0	0	0	0
Mar	5	62	42	8.5	1	0	0	0	0	0	0	0.1	0.1
Total	2	26	34	9.0	1	0	0	0	0	0	0	0.1	0.1
Cottonwood Creek													
May	6	0	100	18	0	0	6	0	0	0	0	0.3	0.3
Total	6	0	100	18	0	0	6	0	0	0	0	0.3	0.3
Marsh Creek													
XXX	4	100	0	2	0	0	0	0	0	0	0	0	0
Total	4	100	0	2	0	0	0	0	0	0	0	0	0
Pebble Creek													
May	39	100	0	77	7	0	3	0	0	0	0	0.1	0.1
Jul	9	100	0	9	0	0	6	0	0	0	0	0.7	0.7
Total	48	100	0	86	7	0	9	0	0	0	0	0.2	0.2
Peck Creek													
Jun	5	100	0	1.5	0	0	0	0	0	0	0	0	0
Total	5	100	0	1.5	0	0	0	0	0	0	0	0	0
Portneuf River													
May	57	74	26	111	16	2	6	0	0	0	0	0.2	0.2
Jul	47	60	40	78	13	0	4	0	0	0	1	0.2	0.2
Total	104	67	33	189	29	2	10	0	0	0	1	0.2	0.2

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Table 6. Continued.

River or Stream-month	No. of Anglers Interviewed N	% Res	% Non-Res	Hours fished	Fish harvested HRB	WRB	CU	Perch	LMB	Blgll	BRNT	Catch rates Fish/h	Trout/h
Stockton Creek													
May	3	100	0	3	0	0	0	0	0	0	0	0	0
Total	3	100	0	3	0	0	0	0	0	0	0	0	0
Toponce Creek													
May	56	100	0	106	30	9	7	0	0	0	0	0.4	0.4
Total	**56**	100	0	106	30	9	7	0	0	0	0	0.4	0.4

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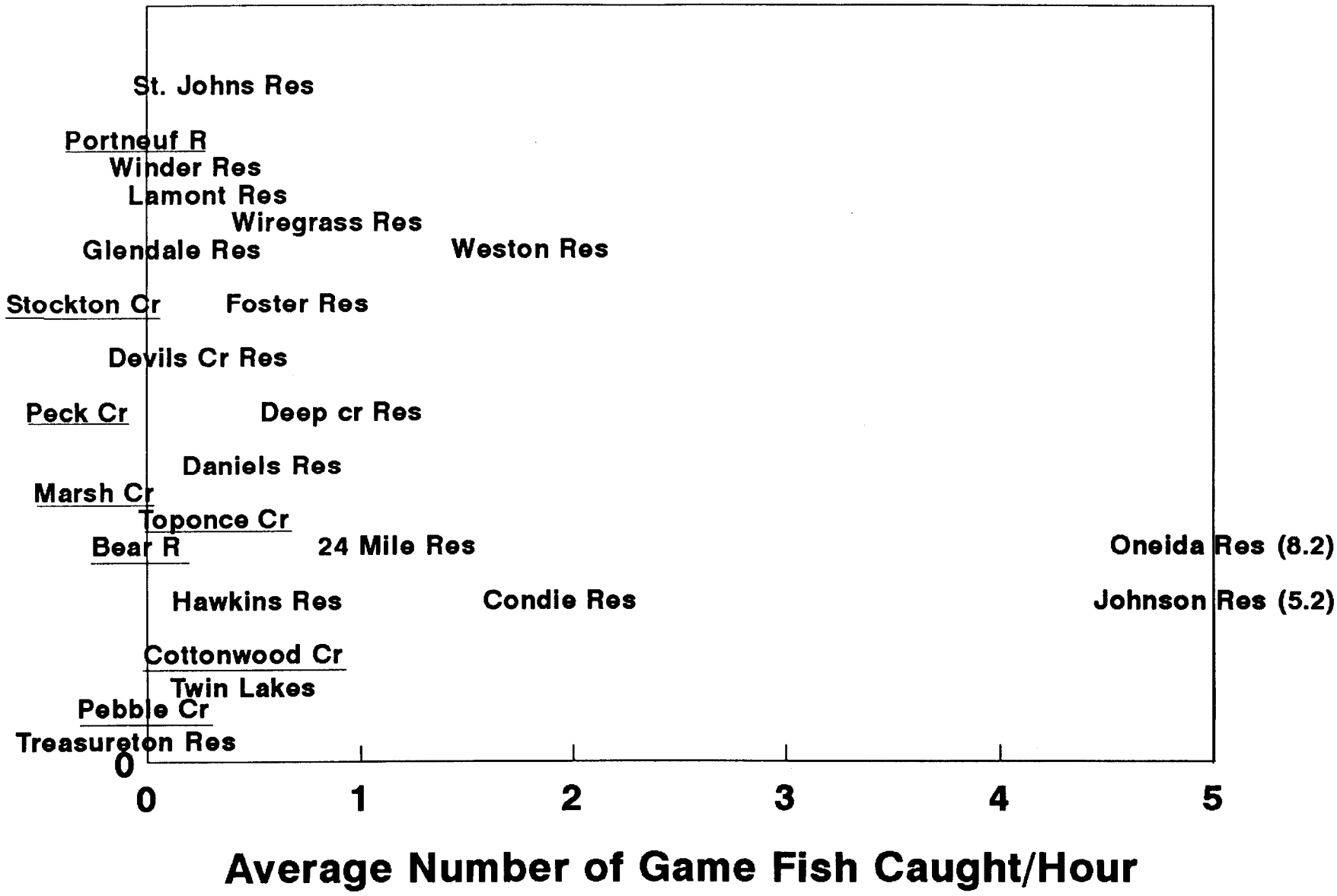

Figure 4. Average number of game fish caught/hour from spot creel checks on several Region 5 waters, 1990.

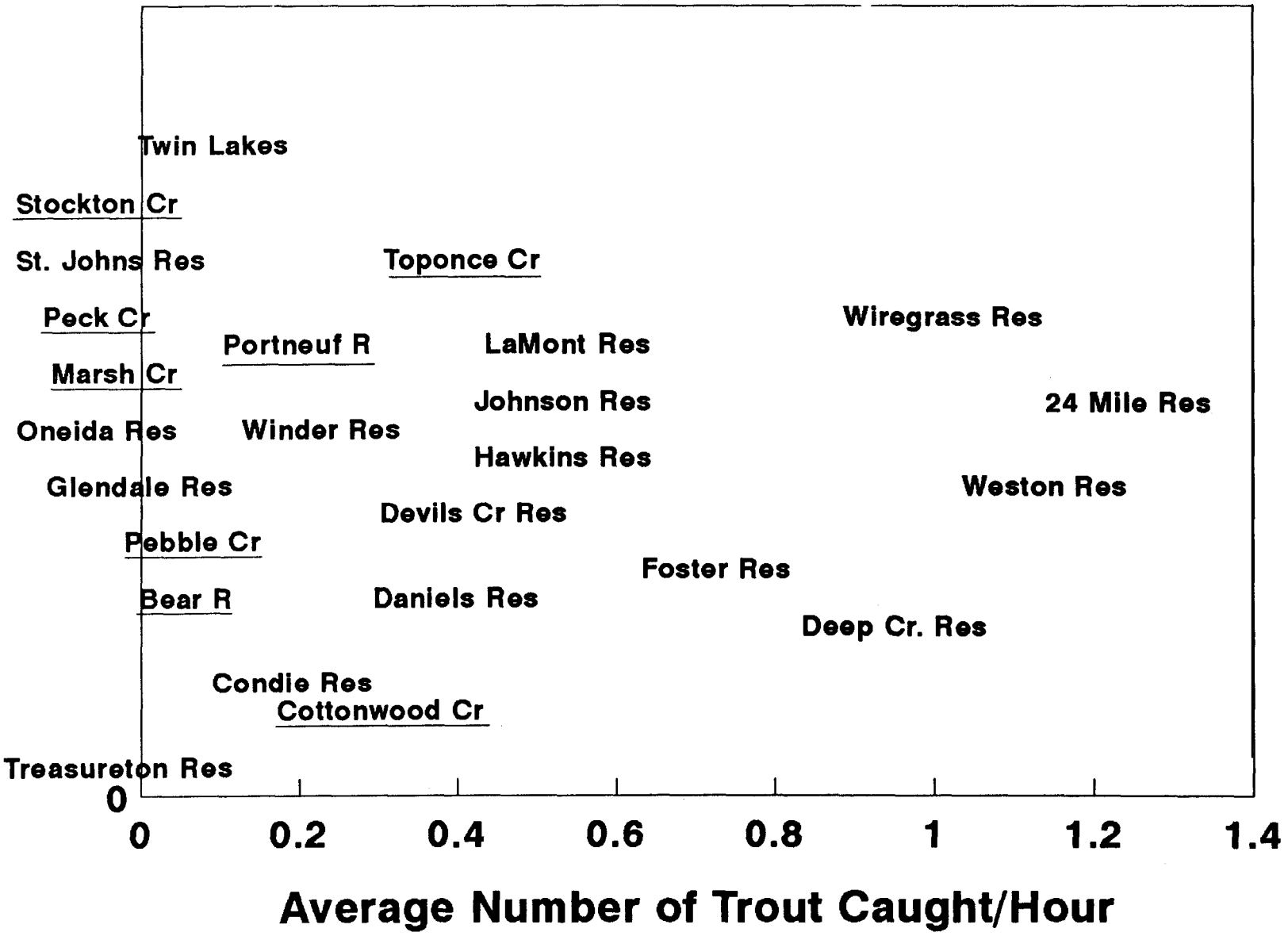

Figure 5. Average number of trout caught/hour from spot creel checks on several Region 5 waters, 1990.

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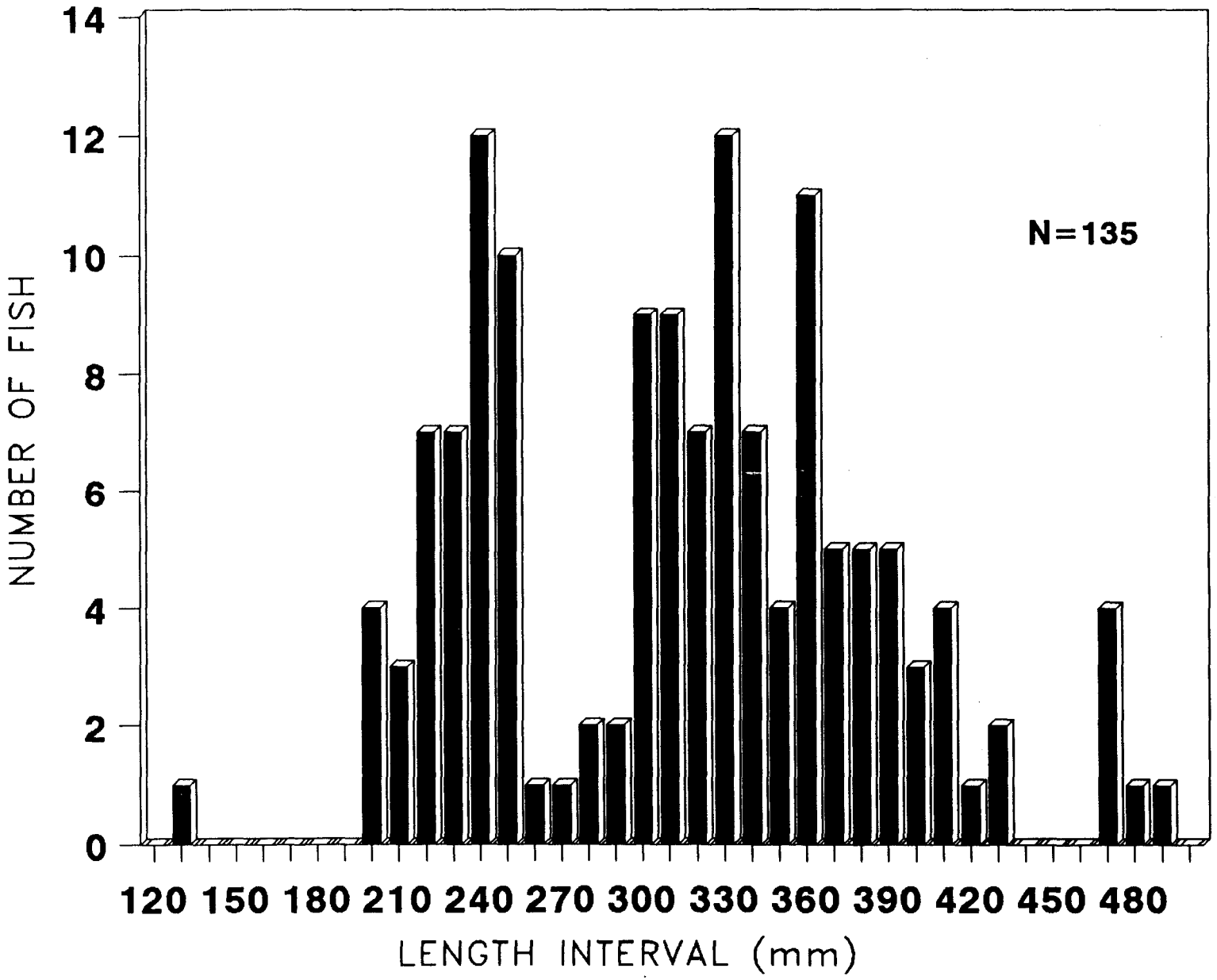
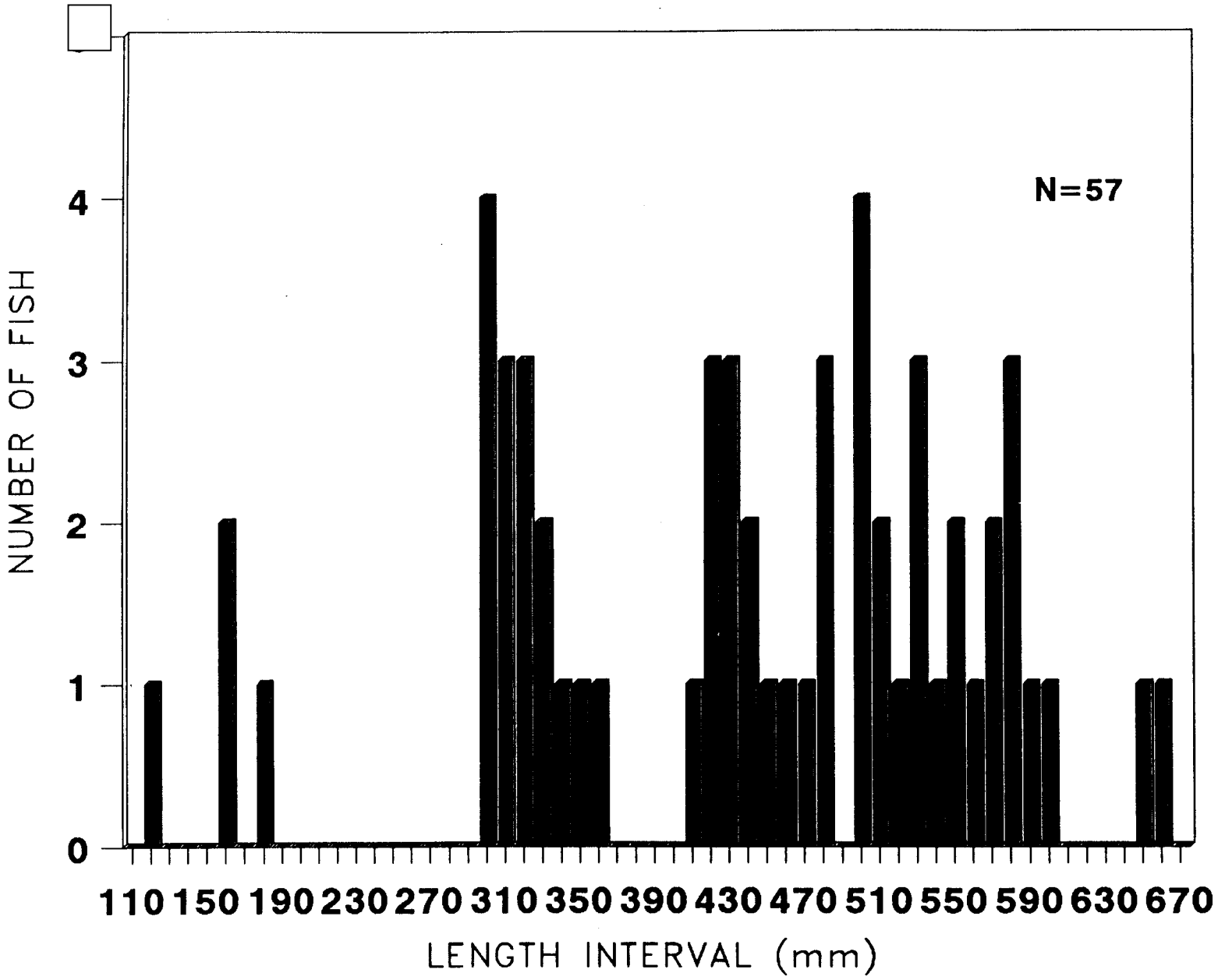
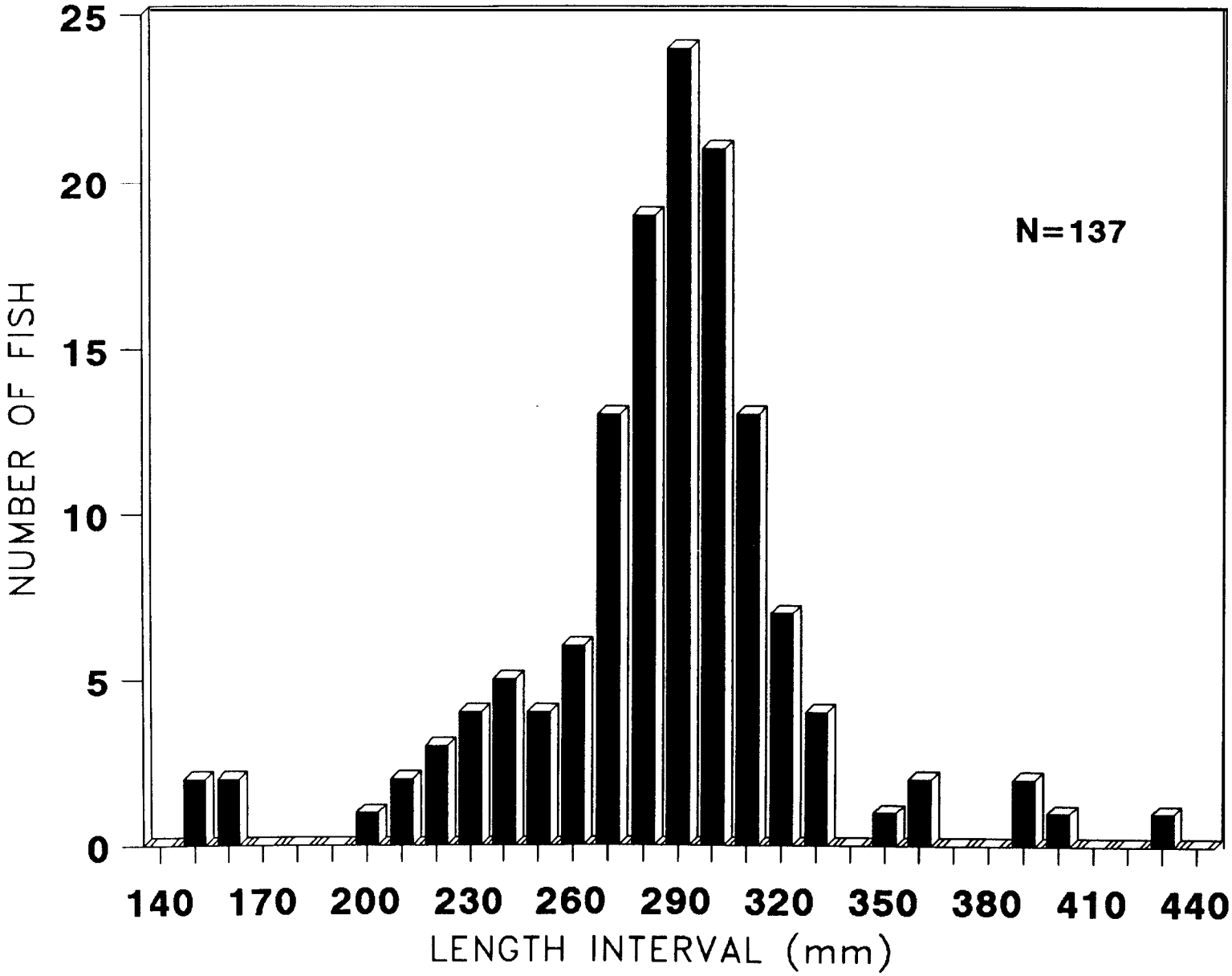


Appendix A. Length frequency distribution of hatchery rainbow trout sampled by electrofishing the Woodville section of the Snake River, October 1990.



Appendix B. Length frequency distribution of brown trout sampled by electrofishing the Woodville section of the Snake River, October 1990.



Appendix C. Length frequency distribution of whitefish sampled by electrofishing the Woodville section of the Snake River, October 1990.

JOB PERFORMANCE REPORT

State of: Idaho **Name:** Regional Fishery Management Investigations

Project No.: F-71-R-15 **Title:** Region 5 Technical Guidance

Job No.: 5-d

Period Covered: July 1, 1990 to June 30, 1991

ABSTRACT

We reviewed proposals and provided written and verbal comments on activities influencing fish and anglers. We coordinated with personnel of various agencies on hydropower, mining, timber, roading, stream alteration, grazing allotments, National Pollution Discharge and Elimination Systems (NPDES) Permits, fill/excavation, and other projects. The Region 5 fisheries personnel worked with anglers in Region 5 to improve rapport and open more channels of communication. These technical assistance activities occupied approximately 12 days of regional fishery personnel time.

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OBJECTIVES

To provide technical assistance to public and private individuals and groups on matters pertaining to fisheries management in Region 5.

RESULTS

Water Right Applications

We reviewed several water right applications for agricultural use in Region 5. None of the applicants' proposed developments would have had deleterious effects on the resource.

Stream Alterations (Idaho Department of Water Resources)

We commented on several stream alteration permits covering activities ranging from those associated with mining, hydropower, timber harvest, roading, etc. Several permits for water source development associated with small private hatchery developments were reviewed.

U.S. Forest Service Projects

We worked with personnel from Caribou National Forest on the Rasmussen Ridge project and numerous smaller projects. A joint effort was planned to erect a stream corridor fence along the lower end of Pebble Creek to reduce adverse grazing impacts.

U.S. Bureau of Land Management Projects

We worked with area Bureau of Land Management staff on Lower Blackfoot River grazing allotments and possible fencing projects. The fish barrier removal on Fish Haven Creek and several other developments were discussed.

Idaho Department of Lands

We held the annual coordination meeting with Idaho Department of Lands and commented on proposed land trades, grazing allotments, timber sales, mine reclamation and on the Forest Practices Act procedures relating to private timber sales.

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ACKNOWLEDGEMENTS

We would like to thank Marjorie Daley, Wolf Read, and Wes Cannon who helped during field activities. Wes Cannon was a tremendous help with several fishery projects in the Soda Springs-Grace, Idaho area.

LITERATURE CITED

Behnke, R.J. 1979. Monograph of the native trouts of the genus Salmo of Western North America. USDA Forest Service, USDI Fish and Wildlife Service/Bureau of Land Management. 163 p.

Chaney, E., W. Elmore, and W. Platts. 1990. Livestock Grazing on western riparian areas. U.S. Environmental Protection Agency.

Everhart, W. H., A.W. Eipper, and W.D. Youngs. 1975. Principles of fisheries Science. Comstock Publishing Associates. Ithaca, New York. 288 p.

Idaho Department of Fish and Game. 1990. Draft Fisheries Management Plan 1990-1995. Idaho Department of Fish and Game, Boise, Idaho.

Henderson, H.F., and R.L. Welcomme. 1974. The relationship of yield to morpho-edaphic index and numbers of fishermen in African inland fisheries. CIFA occasional paper number 1. Food and Agriculture Organization of the United Nations, Rome.

Lukens, J.R. 1988. Regional fisheries management investigations, Job Performance Report, Project F-73-R-10. Idaho Department of Fish and Game, Boise.

Schill, D.J., and J.T. Heimer. 1988. Regional fisheries management investigations, Job Performance Report, Project F-71-R-12. Idaho Department of Fish and Game, Boise.

Schill, D.J., and L.D. LaBolle. 1990. Regional fisheries management investigations, Job Performance Report, Project F-71-R-13. Idaho Department of Fish and Game, Boise.

Scully, R.J., and D. Anderson. 1989. Regional fisheries management investigations, Job Performance Report, Project F-71-R-12. Idaho Department of Fish and Game, Boise.

Thurow, R.F. 1980. Blackfoot River Investigations. River and stream investigations. Project F-73-R-3. Idaho Department of Fish and Game.

Wallace, R.L. 1978. Report on purity of bonneville cutthroat trout, Salmo clarki utah, from upper Giraffe Creek, Bear River drainage, Idaho. Project completion report to Caribou National Forest, 9/78: 5 p.

Wallace, R.L. 1980. Report on purity of bonneville cutthroat trout, Salmo clarki utah, from Preuss and Dry creeks, Bear Lake County, Idaho. Project completion report to Caribou National Forest, 1/80: 5 p.

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